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THE THERAPEUTIC VALUE OF THE MIXED TOXINS OF THE STREPTOCOCCUS OF ERYSIPELAS AND BACILLUS PRODIGIOSUS IN THE TREATMENT OF INOPERABLE MALIGNANT TUMORS,

WITH A REPORT OF ONE HUNDRED AND SIXTY CASES.[1]

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In a series of papers already published[2] I have reported the results of my investigations concerning the action of the streptococcus of erysipelas and its toxins upon inoperable malignant tumors. In the earlier papers an attempt was made to set forth the clinical and experimental evidence then existing in support of the view that an attack of erysipelas occurring by accident, or brought about by inoculation, in a patient suffering from malignant disease, not infrequently produced marked improvement, and in some cases permanent cure. It is unnecessary to go again over the ground, and it is sufficient to state that a considerable number of cases reported by competent observers, of undoubtedly malignant tumors, have been permanently cured by an attack of erysipelas. Czerny has recently added two most important observations bearing upon this question.

The seven observations of Fehleisen, in which he produced erysipelas by inoculation—in one of which the tumor disappeared entirely, and nearly all of which showed improvement—furnish additional evidence

[1] Read before the Johns Hopkins Medical Society, April 6, 1896.

[2] Annals of Surgery, September, 1891. The American Journal of the Medical Sciences, May and July, 1893; ibid., July, 1894. N. Y. Med. Record, January 19, 1895.

in support of the view that the streptococcus of erysipelas has in it some quality that exerts an antagonistic influence upon the cells of malignant tumors.

The case that led me to take up these investigations was one of small round-celled sarcoma of the neck, which had been operated upon by Dr. William T. Bull five times at the New York Hospital. At the last operation, in 1884, it was found impossible to remove the growth. The patient was given up as hopeless. A few days later an attack of erysipelas occurred, followed by a second attack shortly after the first had subsided. The tumor entirely disappeared. I was able to trace the patient and found him alive and quite free from recurrence in 1891, seven years afterward.

My first experiments were conducted with repeated injections of living bouillon-cultures of the streptococcus of erysipelas, introduced into the substance of the tumor, and the results in a series of ten cases were brought before the Surgical Section of the New York Academy of Medicine in December, 1892. Two of these cases, both inoperable, hopeless cases of recurrent sarcoma, are alive and well, one more than three years, and the other more than four years after treatment. The unmistakable improvement that followed the repeated injections even when no erysipelas was produced—especially in sarcoma—led me to believe that a portion, if not all, of the curative influence might be due to the toxins, rather than to the action of the germ itself.

This point was one that could be easily determined by experiment. The great advantages of the toxins over the living cultures were at once apparent. First, the element of danger, which was not inconsiderable, I myself having had two deaths from inoculating the living germ, was eliminated. Secondly, it was possible to regulate with some degree of accuracy the dose of the toxins, a thing quite impossible when using living cultures. Furthermore, my own experience, as well as that of others, had proved that it was often extremely difficult and sometimes impossible to produce erysipelas even with very virulent cultures.

In my first experiments with the toxins (in 1872) I simply sterilized the bouillon-cultures by heating them to 100° C., and then injected them into the substance of the tumor. The symptoms and reaction corresponded almost exactly with those following the use of the living cultures, though they were less severe and shorter in duration.

Knowing that the action of heat produced certain chemical changes in the toxic products of bacteria, I next used the soluble products by passing the living bouillon-cultures through a Kitasato filter and using the filtrate. The reaction was similar to that described following injections of the living cultures, but decidedly less severe and less persistent. The local redness and induration were also much less marked. The effect on the tumors, especially sarcoma, was to inhibit

the growth, and in some cases to diminish the size. The solution was so weak that it required very large doses, 2 to 4 c.c., to produce much reaction.

In order to increase the virulence of the cultures and the strength of the toxins I made use of the principle demonstrated by Roger, of Paris, that the bacillus prodigiosus, a non-pathogenic organism, has the power to intensify certain pathogenic germs, notably erysipelas. As far as I am aware, no one had tried a combination of erysipelas streptococcus with any other germ, or their mixed toxins in the human being, nor had the idea ever been suggested in connection with the treatment of malignant tumors. With the valuable aid of Dr. Alexander Lambert, at that time Fellow in Bacteriology at the College of Physicians and Surgeons, a filtrate containing the soluble toxic products of the streptococcus of erysipelas (obtained from a fatal case) and another containing the soluble products of the bacillus prodigiosus were prepared. These solutions were sterilized by filtration without the use of heat, and preserved in glass-stoppered bottles by the addition of thymol crystals.

The two solutions were mixed at the time of using in about the proportion of one part of the bacillus prodigiosus toxin to four or five parts of the erysipelas-toxin. The reaction that followed was much more severe — a chill coming on in one-half hour to an hour after the injection, and lasting fifteen to forty-five minutes. Nausea, vomiting, severe headache, with temperature 103° to 104°, usually followed an injection of ♏ ij to iv of the bacillus prodigiosus toxins, with ♏ viij to xvj of the erysipelas-toxins. The reaction and disagreeable symptoms usually subsided within twelve hours, but not infrequently a marked herpes labialis followed. The effect upon the tumors was much more marked than when the erysipelas-toxins alone were used.

A little later, at the suggestion of Mr. B. H. Buxton, Director of the Loomis Laboratory (without whose untiring zeal and unremitting assistance during the past three years much of this work would have been impossible), the two germs were grown together in the same broth, the erysipelas streptococcus being first grown alone for ten days, the prodigiosus-toxin then added, and the two allowed to grow together for ten days. The results showed this to be a further improvement in technique. Two years ago I made another change, with a view to utilize whatever of value might exist in the toxins contained in the dead germs themselves. The cultures were heated to a temperature sufficient to render them sterile (which was found to be 58° to 60° C.) for one hour, and then used without filtration. This preparation proved to be by far the strongest, and experience has shown it to be superior to the filtered solution in its action upon malignant tumors.

The value of all the preparations of the toxins has been found to depend largely upon the virulence of the original cultures employed, and in the successful cases the toxins were all made from cultures obtained from

fatal cases of erysipelas. The culture gradually loses its virulence after a few generations, and various means were used to restore it, the most efficient being to pass the culture through a series of rabbits. Marmorek, at the Pasteur Institute in Paris, has succeeded in developing a remarkable degree of virulence in the streptococcus by this method. The most powerful preparation of the mixed toxins that Mr. Buxton has been able to make produced very severe constitutional symptoms, with a prolonged chill and a temperature of 104½° in doses of one-half a minim (0.066 c.c.).

It is very important to remember that much larger quantities can be borne when injected subcutaneously than when injected directly into a vascular tumor, the difference being undoubtedly due to the more rapid absorption in the latter instance.

I have adopted the plan of beginning with a very small dose—*e. g.*, one minim of the filtrate, or one-half a minim of the unfiltered toxins—and gradually increasing the dose each day until the reaction-temperature reaches 103° to 104° F. The temperature has been the chief guide in estimating the dose, and very little benefit has been noted in cases in which no reaction was obtained. The frequency of the injections has depended upon the general condition of the patient and upon the rapidity of recovery from the depression of the preceding dose.

Usually the injections have been given daily, aiming to get two or three well-marked reactions during a week. If well borne, the treatment has been continued from two to three weeks, and if at the end of that time no decided improvement has taken place, it has been discontinued. In some of the successful cases it has been kept up for three or four months, occasional intervals of a few days' rest having been allowed. In several instances, in spite of the reaction and depressing effects, the patients have steadily improved in general condition and have gained markedly in weight.

With this brief *résumé* of the method of preparation, let us proceed to an analysis of the cases treated, which form the basis of the present paper. There are three important questions which a careful study of these cases ought to enable us to answer:

First. Have these toxins any antagonistic or beneficial influence upon malignant tumors?

Secondly. If so, in what varieties of tumors is this influence most marked?

Thirdly. Is this action permanent in character or merely temporary?

Grouping the cases according to their several varieties we have: Sarcoma, 94; round-celled, 52; spindle-celled, 14; melanotic, 7; chondro-sarcoma, 2; sarcoma, special type of cell not stated, 8. Carcinoma, including epithelioma, 63; of breast, 31; of uterus, 3; of cheek, 4; of

sternum (secondary), 1; of tongue, 4; of neck, 3; of rectum, 3; of lip, 2; sarcoma or carcinoma, 10 cases.

In addition to the above cases of malignant tumors eight other cases have been treated with the toxins. These were as follows: tubercular, 2 cases; keloid, 1; goitre, 2; recurrent fibro-angeioma, 1; mycosis fungoïdes, 1; fibroma, 1.

Of the cases of sarcoma, forty-five, or more than one-half, showed more or less improvement. The variety that showed the greatest improvement was the spindle-celled sarcoma; that which showed the least was the melanotic. Next to the spindle-celled, in the order of benefit, was the mixed-celled, round- and spindle-, then round-celled; while osteosarcoma closely approached the melanotic in showing but little effect of the toxins. In a series of seven cases of melanotic sarcoma no improvement was observed in five cases, and very slight change in the two others. It should be observed, however, that in most of these cases the tumors were multiple and the disease thoroughly generalized before treatment was begun. Yet, in all these cases the antagonistic action of the toxins was so trifling that, were it not for the fact that at least one case of melanotic sarcoma has been cured by accidental erysipelas, there would be little to encourage one to a further trial of the toxins in this class of cases.

With osteosarcoma the results are scarcely more satisfactory. Most of the cases showed slight improvement; one case, a very large osteochondrosarcoma was apparently cured, remained well for nearly a year, and then recurred. Further treatment caused temporary improvement, but the patient has since been slowly getting worse, and a fatal termination will undoubtedly occur. This case is very important on account of the size of the original tumor. The fact that it recurred after it had been once apparently cured renders the diagnosis absolutely certain.

In one case of round-celled sarcoma of the neck, of very rapid growth, the tumor decreased from the size of an orange to the size of a hen's egg in one week, after three injections of the mixed toxins. No further reduction took place, and in spite of large doses of the toxins the tumor again began to increase rapidly in size and caused death within three months. In many of the other cases of round-celled sarcoma the improvement was very striking, but in only two cases of purely round-celled sarcoma did a cure result.

In one case of round-, spindle-, and oval-celled sarcoma (recurrent) the tumors disappeared, and the patient is alive and well more than three years after treatment.

The spindle-celled variety, though embracing a small proportion of the total number of sarcoma cases, forms by far the largest proportion of successful cases. The reason for this remarkable difference in the action of the toxins upon the different types of sarcoma is not apparent, but an attempt to explain it will be made later on.

Carcinoma. I have thus far been extremely conservative in advocating the toxins in anything but inoperable sarcoma, though I have been steadily experimenting upon carcinoma. My results in carcinoma, while far from ideal, are still such as to lend encouragement to the belief that we are working along the right lines, and that at no very distant day we shall attain in carcinoma some measure of the success that has already been achieved in sarcoma.

The number of cases of demonstrated carcinoma that have been permanently cured by accidental erysipelas would seem to give additional weight to this view. I believe that we have in the toxins nearly, if not quite, all the virtue that exists in the living germ and in a form that can be utilized without risk to the patient.

I have seen undoubted improvement follow the injections of the toxins in a considerable number of cases of inoperable carcinoma. In two cases the tumors disappeared and the patients are at present well, one a year and nine months after treatment, and the other a year. A third case of rapidly growing, twice recurrent carcinoma of the breast, in which a large gland the size of a hickory-nut, encircling the axillary vessels high up, was left at the last operation, February, 1895, has shown very markedly the controlling and inhibiting action of the toxins. In April, 1895, the tumor had recurred in the cicatrix, measured one and a half by two and a half inches, and was growing rapidly. The pectoral muscle was hard and infiltrated. The patient has had the toxins three times a week since, or more than a year. The ulcerated carcinomatous base has been excised once since, but recurred in a few weeks. The induration in the pectoral muscle has nearly disappeared. The diseased gland left in the axilla cannot be felt, and there is no swelling of the arm. The patient weighs ten pounds more than a year ago, and is apparently well at present, June 9, 1896.

This case is not cited as even a probable cure, but simply to show in a striking way the influence of the toxins upon a rapidly growing, recurrent carcinoma, the diagnosis of which has been confirmed by several microscopical examinations.

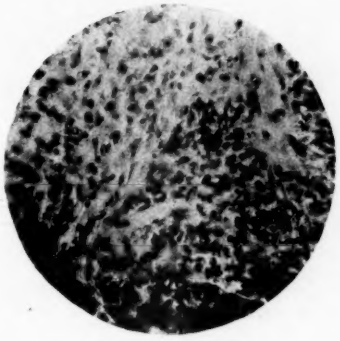
I believe that the chief value of the toxins in carcinoma will probably be found in their use after a primary operation to lessen the chances of recurrence. This is a question that can only be settled by several years of experiment. It seems, however, reasonable to believe that the toxins would have a far better chance to destroy the invisible traces of infection left behind after operation, than after a palpable tumor has developed. One surgeon has written me that he operated upon three cases of advanced carcinoma of the breast in which erysipelas developed during the wound-healing. In no case did recurrence follow, and the cases were traced for a long period—five to fifteen years.

Let us now turn to the third and by far the most important question, Is the action of the toxins permanent—that is, really curative—or not? It is evident that only cases that have remained well for a considerable length of time can be considered in answering this question. Four cases, all pronounced inoperable by well-known surgeons, and in every one of which the diagnosis was confirmed by careful microscopical examination by competent pathologists, are at present well and free from recurrence two and one-half to four and one-half years after treatment. It would seem proper to regard these cases as permanently cured. The oldest case cannot strictly be classed as a cure from the toxins alone, because living cultures were used. Yet this case is, I believe, the only one on record cured by artificially produced erysipelas that has been traced beyond one year. These four cases alone, which were completely hopeless, are, I think, sufficient to demonstrate the curative power of the streptococcus and its toxins upon sarcoma.

The most important cases are reported with some detail, and the remainder summarized.

CASE I. *A twice recurrent inoperable sarcoma of the neck with large secondary sarcoma of tonsil; treated with repeated injections of living cultures of erysipelas for four months; well four years after treatment.*—The patient had been operated upon twice by Professor Durante of Rome, and last by Dr. W. T. Bull at the New York Hospital in March, 1891. The tumor of the neck was so large that only a portion could be removed, and the general condition of the patient when I began treatment, May 4, 1891, was so bad that he was expected to live but a short time. The tonsillar tumor was so large that it was impossible to swallow solid food, and liquid food was taken with difficulty.

FIG. 1.



CASE I.—Myxosarcoma.

From May 4 to October, 1891, I treated the patient with repeated local injections of living bouillon cultures of the streptococcus of erysipelas. No attack of erysipelas occurred until October, yet improvement followed the injections, and whenever they were discontinued the growth increased in size.

On October 8th a severe attack of erysipelas followed the injection of a new and more virulent culture. During this attack the tumor of the neck nearly disappeared, the tumor of the tonsil decreased in size, and the general condition of the patient rapidly improved until he had regained his usual health and strength. He has had no treatment since October 8, 1891, and he was in good health in October, 1895. He has been repeatedly examined by myself and other surgeons. My last examination, made in September, 1895, showed a small mass at the site of the old scars upon the neck, apparently made up of cicatricial and fibrous tissue. It had remained unchanged for four years. The tumor of the tonsil was still present, though it had apparently shrunken some in size, and the features of malignancy must have been either entirely lost or in complete abeyance. The general condition was excellent.

FIG. 2.

CASE I.—Inoperable sarcoma of neck.

[Copy from Records, N. Y. Hospital Laboratory.]

Specimen No. 1870. *Microscopical examination and report.* "Operation, a piece of tumor about the size of an orange was removed, but a portion yet remains, being too deeply seated for extermination.

"Microscopically the tumor (Fig. 1) is composed of fibrous tissue and spindle-cells, the fibrous tissue predominating in places and in others the spindle-cells.

"There are many areas of cells resembling mucous cells, and to be differentiated from myxomata; vascular supply abundant and vessel walls-formed by tumor-tissue.

"Diagnosis, 'myxosarcoma.'"—Dr. Farquhar Ferguson, Pathologist to the New York Hospital.

CASE II. *Large recurrent sarcoma of the back and groin; entire disappearance of both tumors; patient in perfect health without recurrence four years after the beginning and more than three years after the cessation of treatment.*—This

patient was a male, aged forty years, with a sarcoma of the back (lower lumbar region) 7x4 inches, with a secondary tumor the size of a goose-egg in the groin. The groin-tumor had been removed in January, but rapidly recurred. The patient was examined by Dr. William T. Bull, who regarded the case as inoperable sarcoma. The same diagnosis was made by a number of other surgeons. The tumor (Fig. 2) was photographed by Dr. George H. Fox, and a section was removed under cocaine and examined by Dr. Farquhar Ferguson, pathologist to the New York Hospital, and the diagnosis confirmed.

FIG. 3.

CASE II.—Sarcoma of back and groin. Well three and a quarter years after treatment.

A full history of the case has already been published.[1] Treatment was begun in the erysipelas-wards of Bellevue Hospital in April, 1892, and daily local injections of living bouillon-cultures of erysipelas were given for two weeks before an attack of erysipelas was produced. The attack was very severe, but during the attack and the few succeeding days both tumors entirely disappeared. Recurrence followed in July, and both tumors grew more rapidly than before. The injections were resumed, and between October, 1892, and January 1, 1893, he had four additional attacks of erysipelas, but mild in character.

In December, 1892, he was exhibited before the Surgical Section of the New York Academy of Medicine. The influence upon the tumors was striking, but less marked and more temporary than the first attack. In January, 1893, I removed the recurrent back-tumor, but left the groin undisturbed. After three weeks there was an apparent recurrence in the back, and I began using the toxic products of erysipelas and bacillus prodigiosus, injecting them locally into the groin-tumor. This preparation was the one made by filtering toxins through porcelain. The two toxins were mixed at the time of using.

The tumors quickly disappeared. The injections were discontinued in March, 1893, and the patient has been in perfect health ever since. (A photograph was taken in April, 1896.)

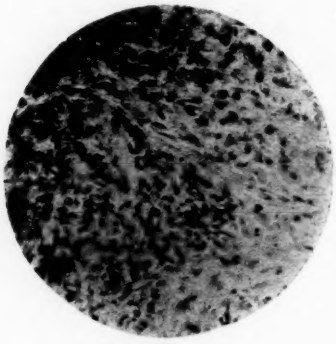
[Copy from Records, N. Y. Hospital Laboratory.]

Pathological report. "The tumor (Fig. 4) is a sarcoma, in which the cells are round, oval, and spindle, in which everywhere there is seen a stroma of

[1] THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, July, 1894.

fibrous tissue, apparently the remains of the subcutaneous tissue which has not been completely destroyed during the development of the tumor. Yellow

FIG. 4.



CASE II.—Sarcoma.

elastic fibres are quite abundant throughout the tumor, but the vascular supply is not very abundant"—Dr. Farquhar Ferguson, Pathologist to the New York Hospital.

CASE III. *Large inoperable sarcoma of the abdominal wall and pelvis; entire disappearance of tumor; no recurrence three years after.*—This case, a boy sixteen years of age, was pronounced inoperable by Dr. L. Bolton Bangs, at the time professor of genito-urinary surgery at the Post-Graduate Hospital. A section of the growth was removed and pronounced spindle-celled sarcoma by Dr. H. T. Brooks, the pathologist to the hospital. Dr. Bangs referred the patient to me for treatment with the toxins, and he was admitted to the New York Cancer Hospital in January, 1893. He was treated for nearly four months with the mixed filtered toxins of erysipelas and bacillus prodigiosus. At the end of this time the tumor had nearly disappeared, and the little that remained was gradually absorbed after the injections were discontinued. There was no breaking-down, and the entire growth disappeared by absorption. The original growth was 7x5 inches in extent, involved apparently the entire thickness of the abdominal wall, was attached to the pelvis, and from symptoms and position evidently involved the bladder-wall. The boy's general condition improved with the disappearance of the tumor, and he has enjoyed the best of health since. He was shown to the members of the New York State Medical Association on October 16, 1895, and was examined by the Medical Board of the New York Cancer Hospital, December 14, 1895. There was no evidence of the tumor remaining. The case is well, May 11, 1896.

Pathologist's report: "Spindle-celled sarcoma."—Dr. Henry T. Brooks, Pathologist to the Post-Graduate Hospital.

CASE IV. *Large inoperable sarcoma of the abdominal wall; entire disappearance; no recurrence two and one-half years afterward.*—This patient was a woman, twenty-eight years of age. An exploratory laparotomy had been performed at the Massachusetts General Hospital, by Dr. Maurice H. Richardson, in August, 1893. The growth was found too extensive to permit of removal, and the wound was closed. A portion of the tumor was removed and examined by the pathologist to the hospital, Prof. W. F. Whitney, of the Harvard Medical School. The diagnosis was "fibro-sarcoma." (Fig. 5.)

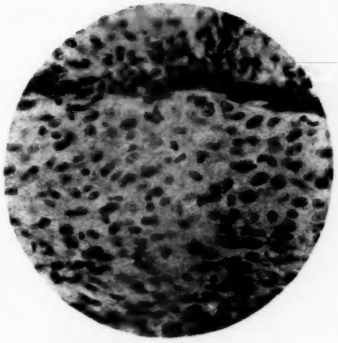
The patient was sent to me by Dr. Richardson in October, 1893, for treatment with the toxins. Local injections of the mixed filtered toxins were given for six weeks; then, after an interval of one month, they were given

for four weeks. At the end of this time only a slight induration remained at the site of the tumor. A few weeks later this also had gone away, and the patient is still in perfect health two and one-half years after, without a suspicion of hardness in the region of the tumor.

In the discussion of my paper before the American Surgical Association, in June, 1894, Dr. Richardson, in reference to this case, said:

"In this case there was no doubt, according to accepted methods of diagnosis, that the woman had a malignant and necessarily fatal disease. The mass filled the right lower quadrant of the abdomen when I operated. I first incised in the median line and came down on the tumor. I then made an incision in the lateral region, with the same result. There was nothing to be done surgically. I took out a section and had it examined. It was pronounced sarcoma. The patient was sent to New York in October. When she came back there was a little induration about the scar. In May there was not the slightest sign that could be detected. Unless the diagnosis was entirely wrong; unless the history, gross appearance, and microscopic examination were entirely wrong, this was a case which must have died sooner or later."

FIG. 5.



CASE IV.—Fibrosarcoma.

August 31, 1893.

"The specimen from the tumor of the abdominal wall was a small, dense, ill-defined, whitish, fibrous-looking mass, which on microscopic examination was found to be made up of large numbers of small cells with a tendency to form fibres. This latter condition was more marked in some places than others. The diagnosis is fibrosarcoma."—Dr. W. F. Whitney, Pathologist to the Massachusetts General Hospital and Curator of the Warren Museum, Harvard Medical School.

[In a personal letter Dr. Whitney states that there was not the slightest doubt of the diagnosis in this case.]

CASE V. *Sarcoma of the leg and popliteal region three times recurrent; disappearance; freedom from recurrence for one and one-half years; then recurrence in the gluteal region.*—This patient, a girl fifteen years of age, had undergone three operations at the New York Hospital, by Dr. William T. Bull. The tumor was a spindle-celled sarcoma, originally starting in one of the metatarsal bones. A Syme's amputation was performed in 1890. Six months later local recurrence appeared in the stump, quickly followed by a second tumor in the popliteal space. In January, 1894, the tumor in the popliteal region was the size of a child's head, and the one in the stump the size of a hen's egg. This large

tumor, or as much of it as was possible, was removed by Dr. Bull in January, 1894, but the smaller one was left undisturbed in order to try the effect of the toxins.

The toxins were given at the New York Hospital, under Dr. Bull's direction, for about two months. The tumor of the stump entirely disappeared, and the patient gained seventeen pounds. She was afterward transferred to my service at the New York Cancer Hospital and the injections continued for a time. The indurated mass in the calf slowly disappeared and the patient remained in good health until the last of October, 1895; a tumor of considerable size was then discovered in the right gluteal region, deeply attached, and occupying the space between the greater trochanter and the tuberosity of the ischium. The toxins were resumed, local injections being made into the tumor. There was slow improvement, the most marked features of which were the increase in mobility of the tumor and the more sharply defined outline. There was also some decrease in size. By February, 1896, it was thought that it could be safely removed, and I excised it under ether. The mass was about the size of two fists, deeply attached and partially encapsulated. The wound healed by first intention and the patient is at present in good health.

FIG. 6.

CASE VI.—Spindle-celled sarcoma of scapula and chest-wall, before treatment. Well nearly two years after. Photograph one and a half years after treatment.

Pathologist's report (No. 1845): "Tumor the size of a child's head, measuring 9 x 7 x 4 ½ centimetres, partly surrounded by a smooth capsule, but presents many freshly incised surfaces; whitish in color; very firm; of little vascularity; and presenting the appearance of fibro-sarcoma.

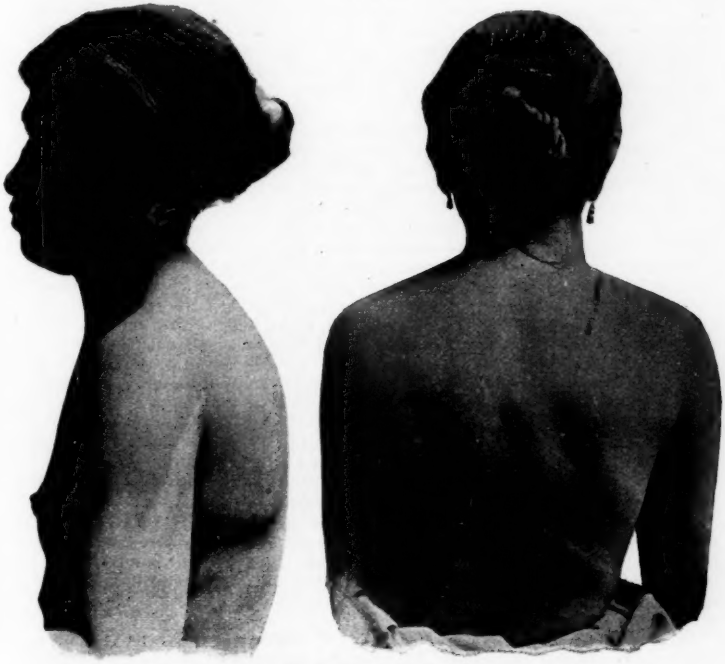
"Microscopic examination of the tumor shows the typical structure of a fibro-sarcoma, with sarcoma elements predominating; vascular supply fairly predominant."—Dr. Farquhar Ferguson, Pathologist, New York Hospital.

[Copy of Records, N. Y. Hospital Laboratory.]

Pathologist's report of tumor removed February, 1896: "Spindle-celled sarcoma."

CASE VI. *Sarcoma of the scapula involving a large part of the left half of the thoracic wall; entire disappearance of the tumor under three months' treatment; patient at present in perfect health without recurrence twenty-three months later.*[1]—The patient was a girl, aged sixteen years, and was admitted to the incurable

FIG. 7.



CASE VI.—Sarcoma of scapula. Photograph nearly two years after treatment.

ward of the New York Cancer Hospital, June 20, 1894. The tumor began in the region of the left scapula, four months before, and at the time the treatment was begun the growth extended to the vertebral line behind, measured thirteen inches vertically, extended around beneath the axilla to the sternum in front. The growth was firmly fixed to the scapula and to the ribs. It was about two inches in thickness in the scapular region. (Fig 6.) The skin over it was perfectly normal and movable. The left arm was so bound down by the

[1] A full description of this case will be found in an earlier paper. New York Medical Record, January 19, 1895.

new growth that it could not be raised to the horizontal position. The general condition was much impaired. The mixed unfiltered toxins were injected locally in the scapular portion of the tumor, and continued, with occasional intervals of one or two days, for three months. The improvement was immediate and very striking.

After three weeks the arm could be raised to a vertical position, and in October, 1894, after three months' treatment, the tumor had entirely disappeared by *absorption* only; she has had no treatment since, and remains perfectly well, July 30, 1896. (Fig. 7.) I regard this case as the most remarkable one in the entire series. It was one of the most extensive tumors that I have ever seen, and I hesitated about even making a trial of the toxins, so completely hopeless did it appear. There was no evidence of previous inflammatory, tubercular, or specific trouble, and the diagnosis could scarcely have been questioned even without confirmation by careful microscopic examination; but the examination made from a section nearly an inch long, removed from the thickest part of the tumor by means of a large-sized Mixter punch (½ inch in diameter), showed it to be typical "spindle-celled sarcoma."

Pathologist's report on section removed from scapular portion of tumor: "Spindle-celled sarcoma."—Dr. H. T. Brooks, Pathologist to N. Y. Post-Graduate Hospital.

CASE VII. *Epithelioma of the chin, lower jaw, and floor of mouth; inoperable; patient well without recurrence two years later.*—This patient, a woman aged thirty-four years, was admitted to the Methodist Episcopal Hospital in May, 1894, with a rapidly growing tumor involving the central portion of the lower jaw, the floor of the mouth, and the soft parts of the chin. There was an area the size of a silver half-dollar upon the chin, which was the seat of a typically epitheliomatous ulcer. A portion was removed and pronounced by the pathologist epithelioma. The tumor had a history of four months' growth. Dr. George R. Fowler regarded the case as inoperable and without hope. He stated that the only operation that could be done would be removal of the lower jaw, floor of mouth, and a part of the tongue; that the risk of death from the operation would be great, and that recurrence within a few months would be almost certain. Dr. Fowler referred the patient to me for treatment with the toxins. In view of the tumor being epithelioma I gave a very bad prognosis, but promised to try the injection.

She was admitted to the New York Cancer Hospital early in June, 1894, and was treated with *mixed toxins unfiltered* (B. prodigiosus and S. erysipelatosus) for about ten weeks. The injections were made into the chin and repeated daily as a rule. In three weeks the ulcerated area had entirely healed, and the diseased portion in floor of mouth had greatly improved.

In September, 1894, the patient had become very much run down from the long-continued injections and severe reactions, and two small ulcers one-fourth inch in diameter appeared in the chin. She was sent home to recuperate. Her only treatment since that time was the administration of tonics and local application of electricity to the chin for a short time by Dr. Sarah V. Burnette.

I had a photograph of her taken October 7, 1895. She was examined by a number of surgeons, December 14, 1895. No indication could be detected in the scar nor in the floor of the mouth, and the patient was in perfect health. The patient was quite well in June, 1896.

Pathologist's report: "Material from chin and lower jaw, May 20, 1894. Sections were not entirely satisfactory, but from gross appearance of the materials and those revealed by the microscope the diagnosis of epithelioma is offered."—William N. Belcher, M D.

Dr. Fowler, in a letter enclosing the pathologist's report, states:

"While I am sure that the case was one of epithelioma, judging from the clinical standpoint, and based upon the history of its rapid growth as well as its recurrence upon removal, yet I am fully aware that epithelial findings, from every standpoint, should be absolutely beyond question. Dr. William

N. Belcher, pathologist to the Methodist Episcopal Hospital, and member of the Brooklyn Pathological Society, made the report, and in a letter explaining his report he states: 'The fragments were frozen by the use of the carbon-dioxide apparatus, and free-hand sections made. Notwithstanding the unsatisfactory picture revealed by the microscope, there seemed to me to be sufficient to warrant the opinion that the material was of an epitheliomatous character. Upon consulting the hospital records, I find that the diagnosis of epithelioma was made by the operating surgeon, presumably prior to my report, and it would seem to me to be as nearly correct as any diagnoses can be.'"

FIG. 8. FIG. 9.

CASE VII.—Epithelioma of chin and floor of mouth. Before treatment.

Same patient one and a half years after treatment. Patient well two years.

This case is presented as fairly as possible, and the profession may form its own judgment as to its value.

CASE VIII. *Recurrent epithelioma of the face.*—The patient, aged forty-five years, male, had a small recurrent epithelioma of the face involving the lower eyelid. The primary tumor I had removed by operation, at the New York Cancer Hospital, eighteen months before, and microscopic examination by Dr. E. R. Dunham proved the growth to be epithelioma. Although the tumor in this case was not extensive, its removal by operation would have necessitated enucleation of the eye, and since he had lost the other eye in youth, I decided to try the toxins before sacrificing the eye. The recurrent tumor was treated at the hospital in February and March, 1895. The growth apparently entirely disappeared, and the patient had had no return up to January, 1896.

CASE IX.—E. I., female, aged twenty-three years, born in Switzerland, lived in the United States for six years. In May, 1894, she had a pain in the right hypochondriac region. Attacks of pain became more and more frequent and severe, and in August, 1894, were so bad that the patient was confined to bed. Operation, German Hospital, August 16, 1894, by Dr. Willy Meyer: Exploratory laparotomy; tumor was found apparently springing from the mesentery, but attached to the omentum and the gall-bladder. It was found impossible to remove it, but a portion was excised for exami nation and abdomen closed. In September, 1894, she was sent to me by Dr. Meyer for treatment with the toxins. At the time there remained a sinus at the centre of the abdominal incision, discharging a thin, viscid fluid. Palpation showed an intra-abdominal mass beneath the cicatrix about four inches in diameter. General condition fair. She was put upon the treatment with the mixed toxins of erysipelas and bacillus prodigiosus, injections being made sometimes in the abdominal wall, sometimes in the buttocks. The injections were given at intervals of every other day, and continued with occasional intervals, until February 7, 1895. There still remained a small sinus at the site just above described, and only an indistinct resistance remained at the site of the tumor. General health seemed perfect. She was readmitted to the hospital in order to attempt to close the sinus, which persisted, and at times became blocked up and caused considerable pain and discomfort. Two attempts were made to close the sinus under ether, the last in September, 1895. An incision carried down to the peritoneum enabled one to make a very thorough examination of the contents of the abdomen, but failed to discover the presence of a tumor. The cicatricial tissue about the sinus was carefully excised and the wound allowed to heal from the bottom. The peritoneum was not opened. Patient was discharged from the hospital on October 12th, sinus still persisting. Examination on January 25, 1896, showed the sinus closed; there was no distinct tumor present, but there was some induration in the region of the cicatrix, which apparently had increased since her discharge from the hospital on October 12th.

Operation, March 4, 1896. An incision three inches long was made at the site of the old cicatrix, and the sinus was followed up until it entered a closed pouch containing two to three ounces of muco-purulent fluid. By carefully enlarging the incision the finger was introduced and the pouch proved to be the gall-bladder. Several calculi about one-half inch in diameter were found tightly wedged in the cystic duct. These were dislodged with great difficulty and the cavity of the gall-bladder drained with iodoform-gauze. The peritoneum was opened for a distance of about one inch and quickly closed with catgut sutures. The most careful examination of the patient failed to reveal the slightest evidence of the tumor which was present at the time of Dr. Meyer's operation one and one-half years before.

In a letter describing his operation, Dr. Meyer states:

"At the physical examination previous to operation, in August, 1894, there was a small, irregular swelling on the outer side of the right rectus muscle about two fingers' width above McBurney's point. On entering the abdominal cavity I found a hard, irregular infiltration, which involved the omentum, ascending colon, loop of small intestine, and the border of the liver, matting together all these parts. Clinically the disease impressed me, as also everybody present, as a malignant growth, probably sarcoma. To define clearly its origin was impossible; it seemed to start from the omentum, as this was especially involved. To remove the growth radically seemed impossible. I also had not the permission of the relatives of the patient to do any major—perhaps here fatal—operation, which latter, in order to be radical, would have to consist in a resection of a portion of the large as well as of the small intestine, and also of a portion of the liver, besides the omentum. I therefore removed a wedge-shaped piece of the growth for microscopic examination and closed the wound in the tumor by two catgut stitches. I regret now not having palpated at that time the gall-bladder,

but a primary disease of the latter, probably due to the presence of gall-stones, did not enter my mind at all. Microscopic examination of the piece removed was made by the pathologist of the German Hospital, Dr. F. Schwyzer, who at that time pronounced it to be round-cell sarcoma. Permit me to congratulate you on the outcome of this very interesting and important case."

CASE X. *Sarcoma of the spine.*—Miss H , aged twenty-eight years, had a small tumor situated about half-way between the right breast and axilla, removed a year and a half ago. It was pronounced benign by the surgeon, but it is doubtful whether a microscopical examination was made. A year ago she began to develop a small swelling in the spine, about the tenth dorsal vertebra. It was supposed to be due to beginning Pott's disease, and was treated accordingly. In June she consulted Dr. V. P. Gibney, of New York, who considered the diagnosis of Pott's disease as probable, and treated her for some time with a plaster jacket. The jacket caused increase rather than decrease of the pain; the swelling slowly but perceptibly increased in size, and her general health became very much impaired. In December, 1894, the tumor had become of such size, and the pain so severe, that the theory of Pott's disease was given up, and a diagnosis of sarcoma of the spine was no longer doubtful. The patient was referred to me by Dr. Gibney, with the idea of trying the toxin treatment if the condition of the patient would permit. When I examined her the middle of December, in consultation with Dr. William Maddren, of Brooklyn, she had been bedridden for several months, and was very much emaciated. Her lower extremities were completely paralyzed, and numerous bedsores were present over the sacrum and ilium. Her heart-action was very feeble and rapid, and her urine contained albumin and casts. Over the lower dorsal region there was a fusiform swelling about six inches in length, the outlines of which were poorly defined. The tumor was absolutely fixed to the spine, so much so that it seemed an enlargement of the spine itself. A peculiar œdematous condition of the skin was present both over the tumor and the entire lower extremities. The condition of the patient was so desperate that I advised against attempting the treatment. A few weeks later, at the urgent request of the family and the attending physician, Dr. Maddren, I began giving very small doses. The treatment was continued by Dr. Maddren; the injections were given sometimes every day, and others at intervals of two days, and kept up for one month. At the end of one month I again saw the case, and the improvement was nothing less than wonderful. The peculiar œdema above referred to had almost entirely disappeared; the tumor itself had diminished very markedly in size; the patient was able to move both legs; the bedsores had taken on a healthy appearance and had partially healed, and the general condition in every way had markedly improved.

The improvement continued until April, 1895, when the bedsores had healed; the patient had regained control over the bladder and rectum, and was able to stand upon her feet and walk a few steps with support. No further improvement occurred, and in May, 1895, she began to get worse, and slowly failed until August, 1895, when she died. Before death other tumors developed in different parts of the body, rendering the diagnosis certain. Two small recurrent tumors in the region of the breast at the site of the original tumor disappeared under the injections of the toxins, although the injections were given in the back.

CASE XI. *Sarcoma of iliac fossa; partial disappearance.*—The patient, aged fifty-five years, was born in Ireland, and had nothing worthy of note in his family or previous history. In January, 1893, he noticed a swelling in his right iliac region. It was accompanied by some pain, and grew steadily in size.

When I first saw him, in June, 1893, when he was admitted to the New York Cancer Hospital, there was a tumor about the size of two fists deeply seated in the right iliac fossa. There was marked pulsation, which was regarded as transmitted, and the tumor was diagnosed as sarcoma. An

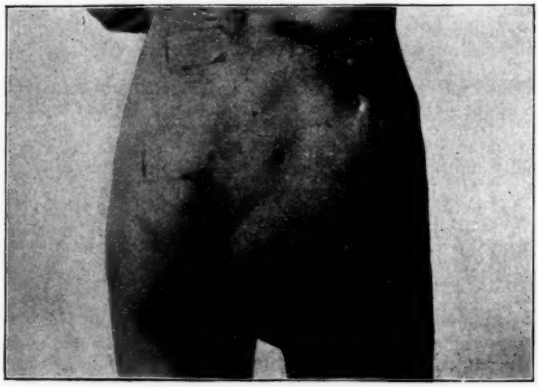
exploratory incision was made, extra-peritoneal, and a portion removed, and the diagnosis confirmed.

Injections of the erysipelas and prodigiosus toxins were at once begun, and continued with occasional intervals the greater part of the entire year. The tumor slowly decreased in size, and at the present time the greater part of it has been absorbed. The patient was in good health one year after treatment, and then lost sight of.

CASE XII. *Spindle-celled sarcoma of palm of hand, six times recurrent; treated with the toxins with temporary success; tumor recurred one year later.*[1]—A rapidly growing sarcoma of the palm of the hand had been held in check for a year and a half by injections of the mixed toxins given at intervals during this period. In June, 1894, the treatment was pushed for three weeks, at the end of which time the necrosed tumor-tissue was removed under ether. No further treatment was given and the patient regained twenty pounds of lost weight. She remained well until August, 1895, when she had a local recurrence, and amputation of the forearm was performed by Dr. Samuel Lloyd. The patient now shows signs of recurrence in the brain.

CASE XIII. *Very large osteo-chondrosarcoma of ilium; disappearance of tumor; recurrence seven months later.*—This case is one of great importance on account of the size as well as the character of the neoplasm. A full history of the case has been published in the paper referred to (*loc. cit.*), and only the main points will be noted here. The patient was a man, twenty-

FIG. 10.



CASE XIII.—Very large osteo-chondrosarcoma of ilium.
Photograph taken seven months after successful treatment with the mixed toxins.

three years of age, with a tumor of one year's duration, occupying a larger portion of the right ilium, and extending from the middle of the sacrum behind to the border of the right rectus in front, filling up the larger portion of the right iliac fossa. He was much emaciated and rapidly losing ground. I saw the patient at the request of Drs. George F. Shrady and F. Kammerer, under whose charge he was, at St. Francis's Hospital. The toxins were begun in March, 1894, and continued under my direction for five weeks. Marked reactions followed the injections (mixed filtered toxins). The tumor after a few days began to soften and break down, and a large area of fluctuation appeared. Free incision permitted the escape of much broken-down tissue and large masses continued to slough out for a considerable time.

[1] The full history of this case may be found in a former paper. New York Medical Record, January 19, 1895.

High temperature continued for a month after the injections were stopped, due to the absorption of dead tissue. At the end of this time improvement began, and he rapidly regained his health and strength. By November 15, 1894, the tumor had apparently entirely disappeared and the patient had gained twenty-nine pounds since August, fully forty pounds since June, and had resumed his work. He was shown before the Surgical Section of the

FIG. 11.

CASE XIII.—Recurred eight months after treatment. Photograph one and a half years after.

New York Academy of Medicine, and Dr. Shrady regarded him as cured. In December, 1894, there was evidence of local recurrence, and in spite of further treatment with the toxins the tumor has steadily increased in size up to the present time. His condition is hopeless, though he is able to walk about with a cane.

No microscopical examination of the original tumor was made, but the rapid growth and enormous size made the diagnosis clear, while the recurrence and prospective fatal issue confirm it. The patient died in July, 1896.

CASE XIV. *Recurrent angiosarcoma of the breast treated with erysipelas-serum*.—A. C., female, aged fifty-nine years, United States. Family history good. Seventeen years ago she was hit upon the left breast by a little boy of seven years; three months later at the site of the blow there appeared a small lump; this grew slowly, was accompanied by some pain, and at the end of three years had reached the size of a fist. The first operation was then performed (fourteen years ago) at St. Francis's Hospital. The breast was not removed, and there were no enlarged glands in the axilla. She remained free from recurrence for seven years, when a tumor recurred, grew slowly for two years, and was then operated upon a second time at the same hospital, by Dr. George F. Shrady (May, 1889); the tumor at this time was the size of an egg, and the diagnosis made by Dr. Shrady was sarcoma. She again remained free from disease for two years, when a tumor recurred *in situ*. Examination January 20, 1895, showed a large tumor occupying the region of the left breast, extending from the anterior axillary line to the sternum, and from just below the clavicle nearly to the free border of the ribs. The tumor was fairly well fixed to the chest-wall, and was markedly protuberant, made up of more or less distinct nodules, the surface of which was purple in color, and in places there was considerable ulceration with foul discharge. The tumor was unquestionably inoperable. The patient's general condition was so extremely weak that she was scarcely able to walk alone. She was admitted to the New York Cancer Hospital on

January 20, 1895, and placed in the "incurable" ward. The disease was so far advanced and the general condition was so bad that no attempt was made to give her the toxins. After the ulcerated surface had become somewhat less foul under careful treatment, and her general condition a little improved, she was placed under treatment with injections of the antitoxin-serum of

FIG. 12.

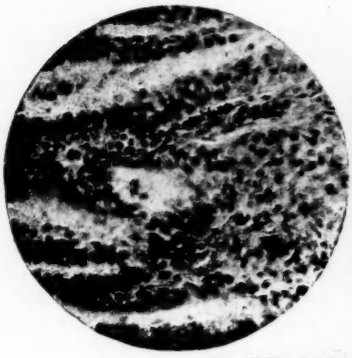
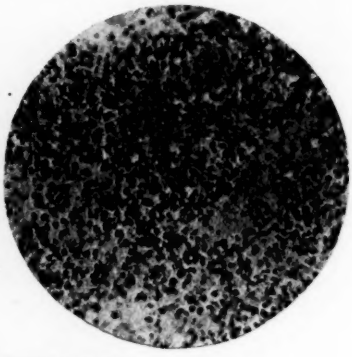


FIG. 13.



CASE XIV.—Angiosarcoma of the breast.

erysipelas and bacillus prodigiosus. This serum was prepared by Mr. Buxton in a manner similar to the diphtheria-serum—the toxins of erysipelas and prodigiosus having been injected daily into a horse for about six weeks, and the serum then withdrawn.

Effect of the injections. In small doses of 5 to 10 minims very little effect was noticed. Larger doses, 15 to 20 minims, frequently caused intense mus-

FIG. 14.

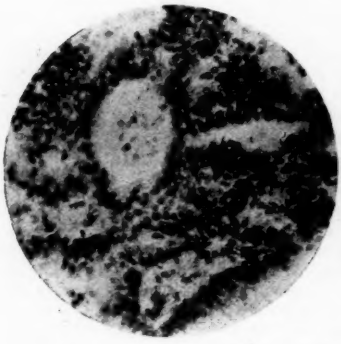
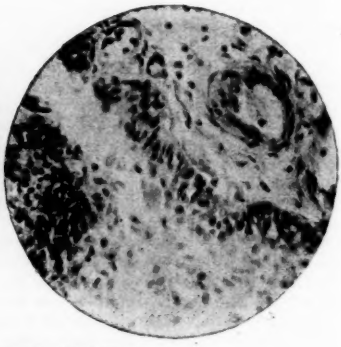


FIG. 15.



CASE XIV.—Angiosarcoma of the breast.

cular pain and an urticaria-like condition of the skin, sometimes extending over the whole back and chest, being the cause of intense itching and discomfort. Patient also complained of very severe headaches, lasting sometimes for several days. The dose was never carried beyond 20 minims, but was, as a rule, given daily. The tumor soon began slowly to decrease in size, and

became much more movable; the general condition of the patient likewise slowly improved. Treatment was continued, with occasional intervals, until September, 1895. At this time the tumor had become so small that it could be easily removed by operation, and not having shown any great diminution in size during the past month, it was deemed advisable to remove it. Ether given, a mass was removed. The periosteum of the ribs was not involved, but as the skin over the tumor was diseased, a large area, four by six inches, was left to heal by granulation. No further treatment was given; the ulcer healed over as rapidly as could be expected, and on December 14th it had entirely healed. There were a few small glands, about one-fourth of an inch in diameter, in the left axilla, but, as the glands on the opposite side were even more enlarged, no attempt was made to remove them. Patient was discharged from hospital the latter part of December, 1895. Examination January 30, 1896, showed the patient in good general condition; no evidence of recurrence found.

Microscopical examination by Prof. T. M. Prudden. "I have examined a large number of sections from different parts of the tumor of breast, and, although there is considerable diversity in detail of the said growth in different parts, I think that the structures are all referable to the type of angio-sarcoma, which accordingly is the anatomical diagnosis." (Figs. 12, 13, 14, and 15.)

CASE XV. *Recurrent spindle-celled sarcoma of the palm of hand; entire disappearance.*—Miss M., aged eighteen years; family history good; injured right hand two years ago. In July, 1895, noticed a small swelling in the palm of the right hand. In October, 1895, it had reached the size of half a hickory-nut, and was removed. The wound suppurated and was seven weeks in healing; it recurred very quickly, and a second operation was performed by Dr. Edward Martin, of Philadelphia, on January 2, 1896. Microscopical examination of the parts removed at the first operation showed it to be sarcoma. The palm of the hand was split open and the tumor found to consist of a thickening in the sheaths of the tendons; apparently the tumor was confined entirely to the sheaths of the tendons; the thickened sheaths were dissected out and the wound closed. The swelling, when Dr. Martin first saw it, was the size of a half dollar, irregular, indurated, slightly raised, and attached to the tendon. Microscopical examination of the tissues removed showed it to be a spindle-celled sarcoma.

Examination on February 15, 1896, showed in the centre of the palm of the right hand a cicatrix 2½ inches long; underneath this was a mass extending the entire length of the cicatrix, one and one-half inches wide at the centre, attached to the skin, and apparently to the tendons, but not fixed to the bony structures; the outline was not well defined. Just above the wrist, along the flexor tendons, was another small mass, about 1 inch in diameter and slightly raised above the surrounding parts. Injections of the mixed toxins of erysipelas and bacillus prodigiosus, filtrate, were begun on the 15th of February, 1896, 2 minims being given, followed by slight headache; no febrile reaction. On February 16th, 1 minim of the unfiltered toxins was given; temperature 100¼°; slight headache. February 18th, 1½ minims of the unfiltered toxins were given, producing a chill lasting half an hour; temperature 101½°; good deal of headache. On the 19th 1½ minims of the unfiltered toxin caused a very severe chill, beginning half an hour after injection; temperature rose to 103°; pulse 160; very severe headache, feeling of bursting of vessels in the head. On the 21st 2 minims of the filtrate were given.

Examination on February 21st showed the mass in palm of the hand very much smaller and much more movable; mass in the wrist has also diminished in size. No local inflammation at the point of injections.

The injections were continued, usually daily, until March 30th. The mass in the palm of the hand had nearly disappeared; the fingers could then be straightened voluntarily; when treatment was begun the fingers could not be extended beyond 120 degrees. The gland in the region of the epicondyle was hardly perceptible. During the last two weeks the injections were made

in the arm entirely, a filtered solution of the mixed toxins being used, and the largest dose being 20 minims.

The treatment was continued for six weeks by the patient's brother, a physician, all the injections being made in the arm. Examination, May 15, 1896, showed the tumor had entirely disappeared and she was able perfectly to extend fingers. She was presented to the New York Surgical Society, May 27, 1896.

CASE XVI. *Probable sarcoma of sacrum; entire disappearance; well one year later.*—H. B. H., male, thirty-eight years of age; born in Ireland and lived in the United States twenty years. Family history good; personal history: always well. In February, 1895, he began to lose flesh and strength, and soon after began to have pain in the lower part of the spine over the region of the sacrum; a little later pain began to shoot down the legs, more marked upon the right; consulted Dr. W. C. Deming, of Westchester, on April 1, 1895. At that time he was beginning to be slightly lame in the right leg; soon after some lameness appeared in the left leg as well. All these symptoms progressively increased; pain was very acute, so much so that the patient expressed a wish to die. On the 2d of May he was sent by Dr. Deming to St. Luke's Hospital. His normal weight of 175 pounds had fallen to 134 pounds. He was so lame that it took him more than one hour to walk from Forty-second to Fifty-fourth Street (a little more than half a mile). He was admitted to Dr. Francis P. Kinnicutt's service, who, on careful examination of the rectum, found a tumor attached to the anterior portion of the sacrum, the lower border of which could be reached with the index finger; the tumor was of firm consistence and fixed to the sacrum; extent of the tumor upward could not be determined as it was inaccessible. The patient was emaciated and his general appearance was very suggestive of malignant disease. The diagnosis of Dr. Kinnicutt and the other physicians and surgeons who saw him in consultation was: inoperable sarcoma.

On May 10th I was asked to see the patient in consultation with Dr. Kinnicutt, and the conditions found were such as above described; my diagnosis was the same as Dr. Kinnicutt's. I advised a trial of the toxins for two or three weeks, but if no improvement should be noticed by that time I advised discontinuance of the treatment. The injections with the mixed unfiltered toxins were begun at once, and made into the buttocks; the treatment was repeated daily and at the end of one week the pain had almost entirely subsided and the lameness had markedly improved The treatment was carried out at St. Luke's Hospital for six weeks; at the end of that time the improvement was so great that the patient returned to his home and on the last of June resumed his work. The injections were continued by Dr. Deming two to three times a week, and were given in the evening and did not interfere at all with his usual occupation. By the end of June—seven weeks after the treatment had begun—the patient had gained 28 pounds in weight, and stated that he felt as well as ever.

Examination on March 8, 1896, shows the patient apparently in perfect physical health; he has no lameness whatever and no trace of his tumor can be detected on rectal examination. His present weight is 175 pounds. He has had no treatment for several months.

The report of this case I owe to the courtesy of Dr. Kinnicutt and Dr. Deming, for although the treatment was carried out under my direction I did not personally have charge of the case.

CASE XVII. *Fibro-angioma of the upper lip.*—J. T., born in Germany, aged thirty-two years; occupation farmer. Was operated upon in Chicago, by Dr. Andrews, in 1892, later by Dr. French, for present trouble. Family history absolutely negative. Since birth has had a thick upper lip, not growing much until twenty-one years old, when lip was thick as little finger and grew very slowly until four years ago, when it began to grow rapidly. Physical examination showed tumor size of a very large orange, involving the entire upper lip, being about nine inches from one corner of mouth to the other. Tumor pulsated synchronously with heart-beats, and was of same

temperature as rest of body. It projected over lower lip to level with tip of chin.

Operation, November 4, 1895, by Dr. Robert T. Morris, of New York. Tumor transfixed with long, narrow scalpel, the handle being used as a hare-lip pin and a figure-of-eight gauze bandage thrown around same; greater part of tumor was then excised.

Two weeks after operation the condition of the patient was as follows: The whole base of the upper lip was occupied by a tumor one inch thick on the right side, extending upward 1¾ inches; on the left side the tumor was thinner, about ½ inch in thickness, and extending upward one inch. The toxins were begun the middle of November, 1895; injections were made into the dense tissue of the tumor about one inch from the lower border. The tumor immediately began to decrease in size and at the end of three weeks had almost entirely disappeared. Dr. Morris then performed a plastic to restore the lip, and in a letter recently received the patient states there has been no return of the disease. Microscopic examination of the tumor showed it to be a fibro-angioma.

CASE XVIII. *Tumor of sternum, tubercular; rapid degeneration under the toxins; disappearance; no return in one and one-half years.*—This case was fully reported January 19, 1895 (loc. cit.), but it is of sufficient importance to note here the subsequent history. The case was reported as a "probable sarcoma," although no positive diagnosis was made by Dr. Ferguson. The tumor was firm in consistence, three inches in diameter, and occupied the upper third of the sternum. It was of four months' duration, and the patient had two sisters suffering from cancer. After one week's treatment the tumor had almost entirely broken down.

Sinuses persisted for several months, and examination of the discharge from the sinuses made by Dr. E. K. Dunham, pathologist to the New York Cancer Hospital, in January, 1895, showed the presence of tubercle bacilli, therefore proving the original tumor to have been probably tubercular in character.

It is of considerable interest to note that a second tumor of apparently similar nature in the left lumbar region, extending over upper part of ilium, underwent rapid degeneration during the injections of the toxins into the sternal tumor; but this was followed by a sinus that failed to close.

The curative influence of accidental erysipelas in *scrofula* was referred to at some length in a very important monograph entitled *Etude Clinique sur influences curative de l'Erysipèle dans la Syphilis*, by Charles Mauriac, published in Paris in 1873, nearly ten years before either the germ of erysipelas or that of tuberculosis had been discovered. Among the conclusions formulated by Mauriac we find this: "The curative influence of erysipelas exercises itself upon all these lesions however remote," showing that he clearly recognized both the local and systemic character of this peculiar action. Very recently Dr. Robert H. Green, of New York, has begun to investigate the action of the mixed toxins of erysipelas and bacillus prodigiosus.

Erysipelas-serum. The experiments with erysipelas antitoxic serum have, with one exception, been followed by negative or very slight results, and have been abandoned. A combined erysipelas and diphtheria antitoxic serum has been tried in two cases of carcinoma, but with little appreciable effect.

Continued experiments verify the opinion before expressed that the

mixed unfiltered toxins of erysipelas and bacillus prodigiosus form the most effective preparation thus far used.

The investigations of Park[1] in diphtheria show that the amount of toxins in the filtrate is not more than one-half of the total amount contained in the liquid culture, and the same is probably true in erysipelas-cultures.

The value of the toxins depends entirely upon the virulence of the culture, and it is extremely difficult to keep the culture up to the requisite standard of virulence. This will explain in great measure the varying results.

Since the last paper, published over a year ago, there has been no change in the methods of preparing the toxins. Cultures have been made in bouillon containing varying quantities of peptone and of various degrees of acidity and alkalinity, but nothing has so far been found better than the ordinary neutral peptone-bouillon.

In preparing the serum the mixed unfiltered toxins were injected subcutaneously into a horse every two or three days for two months, beginning with 5 c.c. and running up to 100 to 120 c.c. As a rule, a rise of temperature of two or three degrees, lasting for several hours, would follow each injection, whilst locally there would be œdema and swelling without formation of pus, the swellings persisting for several days and appearing painful to the touch. The horse was finally bled from the external jugular vein and the serum prepared in the way recommended for diphtheria-antitoxin.

Successful Cases by Other Surgeons Employing this Method.

CASE I.—Dr. Johnson's case of extensive spindle-celled sarcoma of the palate and fauces, extending down to the vocal cords, disappeared entirely under local injections of the mixed, filtered toxins. The case was published in full in the *New York Medical Record*, November 17, 1894. The patient is at present in perfect health, without recurrence, two and one-half years after treatment. The diagnosis of spindle-celled sarcoma was confirmed by microscopic examination. I saw the case in consultation with Dr. Johnson, and can bear witness to the hopeless, inoperable condition prior to treatment.

CASE II.—Dr. John E. Owens, attending surgeon, St. Luke's Hospital, Chicago, has sent me a very complete history of a case of sarcoma of the tibia, successfully treated with the toxins:

The patient, a boy, aged seven years, had received an injury to his leg in July, 1894. In December, 1894, a swelling appeared in the upper portion of the tibia. In March, 1895, exploratory operation was performed, showing a tumor involving the medullary canal. Microscopic examination was made by Dr. E. R. LeCount, of the department of pathology of the Rush Medical College. His report was asfollows:

"The pieces of tissue show that they were removed from a myeloid or giant-celled sarcoma, originating from the bone; they are very hemorrhagic, showing not only free hemorrhage into the sarcomatous tissue, but, also, large blood-spaces are very numerous. I should judge this to be a rapidly growing tumor; its malignancy is unquestioned."

[1] Journal of Experimental Medicine, January, 1896.

Dr. Owens writes: "Before the use of the mixed toxins amputation above the knee would have been at once performed."

The treatment was begun on April 10, 1895, and continued until July 10, at intervals of one to two days. The affected leg had become almost normal in size; the difference in circumference of the two being only one-half inch.

Dr. Owens writes: "When the patient left the city I was led to the conclusion, from the favorable condition of the leg, that a recovery had taken place. At all events, I thought it best to discontinue the toxins and resume them should the limb again present an unfavorable appearance."

The patient was again seen on November 16, 1895, when the scar seemed somewhat elevated, although Dr. Owens did not think that the sarcoma had begun to reappear; further injections, however, were advised as a precaution, but the family decided against resuming the treatment.

In this case Dr. Owens's conclusions were as follows:

"When the treatment with the toxins was discontinued the patient had very much improved in general health; sleep, which before had been very much disturbed, was now all that could be desired. The leg presented a most favorable appearance. I felt gratified that a cure had been effected; and even if some recurrence had occurred, the further use of a remedy which had exercised such a powerful influence would, in my opinion, have brought the case to a successful issue."

CASE III. *Spindle-celled sarcoma of the calf of the leg; entire disappearance under twelve weeks' treatment with the mixed toxins.*—Dr. L. L. McArthur, attending surgeon, St. Luke's Hospital, Chicago, in connection with Dr. Owens, have sent me the following report:

The patient, female, aged forty years, without any family or previous history worthy of note, entered St. Luke's Hospital for the removal of a tumor of the leg. Operation revealed a tumor springing from the dense fascia covering the muscles of the calf. Although a very radical operation was performed, the patient was informed of a probable recurrence, and advised that, if any return were noted, to have an immediate amputation. She re-entered St. Luke's Hospital seven months later with a recurrence in the cicatrix and a tumor, the shape and size of half an egg, bulged from the calf of the leg. Having, in the meantime, tried the mixed toxins on another case, I determined to try them here, partly because the patient was three and one-half months pregnant. Treatment was continued for twelve weeks, with the result of a slow and steady disappearance of the tumor. Patient returned to the maternity ward seven months later; there had been no recurrence. Microscopic examination showed the growth to be a spindle-celled sarcoma.[1]

CASE IV. *Osteosarcoma of the lower end of the radius; three times recurrent; entire disappearance of the tumor under three months' treatment with the mixed toxins.* A second case reported by Dr. McArthur.

"The patient was admitted to the Michael Ress Hospital for recurrence in the cicatrix of a bony tumor, situated in the lower end of the right radius. The patient stated that the growth removed had been pronounced sarcoma by Dr. Christian Fenger, and amputation having been refused the tumor had been removed as thoroughly as possible. Three to four months later a recurrence followed, and he was reoperated upon by Dr. Wyllys Andrews, by the same method. The same diagnosis was made. Speedy recurrence followed. He then consulted Dr. D. A. K. Steele, who advised amputation of the arm. This the patient refused, and thereupon consulted me. I advised amputation, which was refused. I then agreed to try the toxins. After twelve weeks' treatment the growth had entirely disappeared. Three months later I presented the patient to the Chicago Medical Society for examination. I regret that no microscopic examination had been made in the case."

[1] In April, 1896, Dr. McArthur writes me there is a slight suspicion of recurrence.

CASE V. *Round-celled sarcoma of the orbit; marked improvement.*—Dr. McArthur has sent me notes of a third case worthy of brief mention.

A little girl, five and one-half years old, with large, round-celled sarcoma of the antrum of Highmore, extending into the nose, nasal pharynx forming a hard falx, producing extensive exophthalmus; cervical glands markedly enlarged, both anterior and posterior to the sternal mastoid muscle; she was brought to St. Luke's Hospital from Iowa. She had emaciated to thirty-seven pounds; was advised not to make the journey, as she would probably die on the train. She was brought to the hospital on a pillow in an almost moribund condition. After stimulants, tonics, and rectal feeding had been employed for three days, the administration of the toxins was begun; the injections were given every other day, and at the end of two weeks the patient was eating heartily, walking about, and riding on street cars, etc. There was a perceptible diminution in the exophthalmus. Believing I could aid the toxins, I removed the enlarged glands. Examination showed them to be typically sarcomatous. Three weeks later I removed the contents of the antrum, nasal cavity, extending back to the spino-maxillary fascia. The wounds healed primarily; cavity of the antrum was drained for six weeks. The patient was sent back to her home weighing sixty-nine pounds. She was advised to continue the treatment under the direction of her family physician. Getting very intense reactions, the physician discontinued the treatment. Recurrence followed not long after. Treatment was resumed with the result that she again began to improve. The improvement, however, did not continue, and two months later the patient died.

CASE VI.—*A case of extensive inoperable intraperitoneal sarcoma* was successfully treated by Dr. Mynter, of Buffalo, and reported in full in the *New York Medical Record*, February, 1895.

Dr. Mynter writes me under date of May 21, 1896:

"One of my assistants met the patient last week in excellent health; she had had no return of the disease, and you may safely report her as well to date."

The diagnosis of this case was confirmed by exploratory laparotomy and microscopical examination.

CASE VII.—Dr. R. Tilly, of Chicago, under the direction of Dr. McArthur, treated a case of round-celled inoperable sarcoma of the orbit with the mixed toxins. The tumor entirely disappeared. The patient, a short time afterward, died suddenly, when apparently cured. There was no autopsy.

CASE VIII.—Dr. Thomas F. Rumgold treated a case of eight times recurrent round-celled sarcoma of the breast, with the result of entire disappearance of the tumor. The patient died a few weeks later. Autopsy revealed extensive internal metastases. The case was reported as under treatment in an earlier paper.

CASE IX.—Drs. R. M. Stone and C. C. Allison, of Omaha, Neb., have just sent me a complete history of a successful case of inoperable malignant tumor of the uterus. There was marked infiltration of the right broad ligament, and the disease was regarded as too far advanced for hysterectomy. The patient had lost fifteen pounds in weight. Cervix had been removed by operation. At the time when the toxins were begun the patient was suffering from repeated hemorrhages, and three surgeons who saw her in consultation regarded the case as absolutely hopeless. The toxins were begun on December 4, 1895, and given at first in the scapular region, and later in the tumor itself. Improvement was very marked and rapid. On January 29, 1896, the tumor had apparently disappeared and the patient was able to be up and about. She is, at the present time, in perfect health. A number of sections of the tumor were examined by Dr. W. R. Lavender, Professor of Pathology at the Omaha Medical College. Diagnosis of spindle-celled sarcoma was made.

This case will shortly be published in full by Dr. Stone.

CASE X.—Dr. M. Storrs, of Hartford, Conn., has recently sent me a report of a case of large inoperable spindle-celled sarcoma of the axilla, which has entirely disappeared under four months' treatment with the toxins. The

patient was seen in consultation by a number of surgeons, and the case was regarded as entirely inoperable and hopeless. Portions of the tumor were removed at three different times, and microscopic examination showed it to be a spindle-celled sarcoma. A section of the tumor has been examined by the pathologists of the New York Cancer Hospital, and also by Professor William Welch, of the Johns Hopkins Medical School, and the diagnosis was confirmed. This case is, of course, too recent to be looked upon as a cure, but the fact that this large, inoperable tumor, with a diagnosis of spindle-celled sarcoma demonstrated beyond question, has totally disappeared under no other treatment than the mixed toxins, must be regarded as strong evidence that these toxins exert a specific influence on such tumors.

CASE XI.—Dr. Sydney W. Wilcox[1] reports a case of myxosarcoma of the hand treated with the mixed toxins from June until August, 1895. The tumor nearly disappeared under the treatment. Dr. Wilcox states in a letter of April 10, 1896, that there has been no apparent return.

CASE XII.—Dr. J. Flippen, of Thomasville, N. C., has sent me notes of a case of rapidly recurrent sarcoma of the arm. The patient was a physician, seventy-four years of age. During one year he had undergone twenty operations, the tumor recurring after each operation with greater rapidity. When the toxins were begun the largest tumor was the size of a fist. After the injections had been given for two weeks this tumor had diminished to the size of a filbert, and the patient's general condition was markedly improved. At the time when the injections were begun he was confined to his bed; after two weeks' treatment he was able to go about and attend to his practice. He was told by other physicians that the injections were dangerous, and was advised to abandon the treatment. The disease remained quiescent for about three weeks, then the tumor began to increase in size rapidly. Amputation at the shoulder-joint was performed. Three to four weeks later the tumor recurred in the scapular region and quickly caused his death.

CASE XIII.—Czerny[2] gives his experience concerning the treatment of malignant tumors with the injections of the mixed toxins of erysipelas and bacillus prodigiosus in eight cases, four of which were sarcoma and four carcinoma. One case of inoperable round-celled sarcoma of the parotid was cured. It was a rapidly growing tumor of five months' history, occupying the entire region of the right parotid gland, extending back of the ear, and giving complete facial paralysis. The tumor was the size of a man's fist at the time when the treatment was begun. After eighteen injections had been given in the course of six weeks, the tumor had dwindled to three soft nodules, movable in the skin, and all measuring about one and a half by one-half inches. In a letter written May 20, 1896, Czerny states that he afterward excised the small portions of the tumor that remained, and the patient is at the present time quite well. This is the only case in which he has had complete success.

CASE XIV. *Carcinoma of the breast, with very marked improvement.*—Dr. George T. Howland, of Washington, D. C., had under his care a case of carcinoma of the breast, in which the treatment was partially successful. The patient, aged sixty-two years, had a typical carcinoma of the left breast, which was first noticed in September, 1894. In February, 1895, examination showed a tumor involving the major portion of the left breast, being six and one-half inches in the long diameter and four and one-half in the short. It was firmly adherent to the chest-wall; the skin was infiltrated and adherent; axillary glands were enlarged to the size of a hazelnut. A section of the tumor was removed with a Mixter punch for microscopical examination, which showed it to be a scirrhous carcinoma. The treatment with the toxins was begun February 10, 1895, and continued until May, 1895. On Februray 23, 1895, the tumor measured two and one-half by four and one-half inches, having decreased two inches in either direction. It had

[1] North American Journal of Homœopathy, January, 1896.

[2] Muenchener medicinische Wochenschrift, September 3, 1895.

become freely movable upon the chest-wall. The axillary glands had decreased to the size of a hazelnut. In other words, the tumor had become easily operable, and operation was advised but refused by the patient. During May and June, within which time no injections were given, the tumor increased in size. The injections were again tried for a short time with little apparent effect. She continued to grow worse and died on the 22d of February, 1896.

Dr. Howland's conclusions are: "That the toxins exerted a beneficial effect upon the growth, as proved by the measurements given; by the manner in which the tumor was released from its firm adhesions to the chest-wall; by the decrease in the size of the axillary glands; marked changes in consistency; and by the cessation of the pain."

CASES XV. and XVI. Very recently[1] Dr. Henry Matagne, of Bruxelles, has reported a case of cure of an epithelioma of the floor of the mouth. No microscopic examination was made, but the submaxillary glands were enlarged and the diagnosis was confirmed by several prominent physicians, who advised operation, but the patient refused to have an operation performed. The treatment was begun January 10, 1895, and lasted about three months. Dr. Matagne also reports a second successful case of recurrent sarcoma of the neck, the size of an egg, that totally disappeared under three and one-half months' treatment with the mixed toxins. Six months later there was a slight return. A third case of recurrent sarcoma of the neck the size of a fœtal head decreased two-thirds under three months' treatment with the toxins. The patient then consulted a surgeon. The operation proved fatal.

Dr. Matagne used the toxins in three other cases of sarcoma with slight effect, and also in eight cases of carcinoma with very little result.

It is quite true that most of the successes reported by other observers are as yet too recent to be fairly classed as cures, and such is not my object in presenting them. Whether they recur or not, they furnish the strongest possible evidence of the antagonistic and specific influence of the toxins upon inoperable sarcoma, and, in connection with my own cases that have passed the three-year limit, we have proof that such influence may be curative.

It would be hardly possible to expect the profession at large to accept without question or criticism such startling results as I have reported; hence I have related with some detail the successful results of others who have employed this method.

This series of upward of twenty cases of inoperable sarcoma, four of which have remained well for more than two and one-half years, the diagnosis in all of which has been established beyond question, according to the accepted methods of diagnosis, I believe to be sufficient to demonstrate that a real and positive step forward has been made in a field that, up to the present, has resisted every attempted advance of medical science.

I am conscious that there are men who will remain skeptical as to the value of the toxins *in spite* of the evidence here presented. They either fail to see any logical connection between the action of accidental erysipelas and the toxins, or they even go so far as to deny that there are any authentic cases of malignant tumors that were cured by accidental

[1] Gazette Médicale de Liége, May 14, 1896.

erysipelas. The only explanation they have to offer for these results, which cannot be questioned, is that in all of the successful cases there must have been an error of diagnosis.

Such an explanation might be entitled to some consideration were only a single case involved, but to propose it seriously as a satisfactory explanation of the result in twenty cases is, I believe, unworthy of anyone who claims to be guided by scientific principles. Much has been made of the spontaneous disappearance of tumors supposedly malignant. I have made a careful study of the reported cases of this kind, and have failed to find a *single* instance of a tumor disappearing spontaneously or after exploratory operation in which the diagnosis of sarcoma or carcinoma had been confirmed by microscopical examination.

On June 23, 1894, this subject was most thoroughly discussed before the Royal Medical and Chirurgical Society of London, when Greig Smith read a paper upon the "So-called Disappearance of Abdominal Tumors." At that discussion, Mr. Bland Sutton stated that he did not believe in the spontaneous disappearance of any connective tissue or cancerous growths, and the spontaneous disappearance of myomata which had been recorded as based on clinical observation alone. It would be somewhat remarkable that these cases I have reported should be the first and thus far the only ones with both clinical and microscopic diagnosis of malignancy to disappear spontaneously, and it would be more remarkable still that this disappearance should be coincident with the beginning of the treatment with the toxins.

It would be clearly unfair to rule out these cases on the ground of error in diagnosis, without ruling out the cases of cure following operations for sarcoma. Both have been subjected to the same standards of diagnosis, and the cases treated by the toxins have been subjected to more severe tests, inasmuch as in many of the cases the clinical and microscopical diagnoses were confirmed by a number of the best surgeons and pathologists.

Space will not permit entering into a discussion of the theories that have been advanced in explanation of the action of the toxins upon malignant tumors. I will merely say that I still adhere to the opinion expressed at some length in an earlier paper (1892, *loc. cit.*) that the micro-parasitic origin of malignant tumors furnishes the most rational ground for any satisfactory explanation of the action of the toxins.

The evidence in favor of this theory is steadily increasing, and I believe that in the near future it will amount to positive proof. If this theory be correct, it is quite possible that the unequal action of the toxins upon the different types of sarcoma may be due to slightly varying types of the organism that produces the tumor. The recent and most valuable researches of Dr. Thayer at the Johns Hopkins Hospital have shown that the different types of the malarial organism produce different types

of disease, which are by no means uniform in their power of resisting the action of a specific remedy.

Metschnikoff,[1] in 1892, called attention to the close analogy existing between the parasite of malaria and the coccidia, and regarded it as significant that carcinoma should closely approximate the category of miasmatic affections, as proved by its endemic character.

The conclusions that I have drawn from a careful study of this series of cases may be briefly expressed as follows:

1. The mixed toxins of erysipelas and B. prodigiosus exercise an antagonistic and specific influence upon malignant tumors, which influence in a certain proportion of cases may be curative.

2. This influence is slight in most cases of carcinoma (including epithelioma); most marked in sarcoma, but varies with the different types, the spindle-celled form showing by far the greatest influence.

3. The action of the toxins is not merely local in character, but systemic.

4. The toxins should be used only in clearly inoperable cases, or after primary operation to prevent recurrence.

5. The results will vary greatly with the strength of the preparation, the most virulent cultures giving the best results.

I desire to express my very great obligations to Mr. B. H. Buxton, Director of the Loomis Laboratory and Assistant Pathologist to the New York Cancer Hospital, who has spent much valuable time in preparing the toxins. I am also much indebted to Dr. E. K. Dunham, the Pathologist to the New York Cancer Hospital and Director of the Carnegie Laboratory, for the micro-photographs.

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REMARKS ON THE BRUIT DE GALOP AND ITS CAUSATION.

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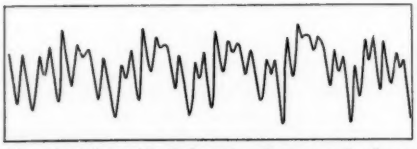
Much interest surrounds most of the abnormal sounds heard over a diseased heart, but the majority of clinical observers possibly pass more or less lightly over the third sound which, interpolated between the normal first and second sounds, forms with them some variety of the bruit de galop.

The varied conditions under which it may appear and the many different characters it may assume seem entitled to give it a more prominent place among physical signs than it generally occupies. Perhaps one reason why many clinical observers merely note its presence without

endeavoring to ascertain its significance is on account of its frequent transitory character. With others, again, the fact that they have no clear idea of its causation leads to lack of interest. They can give an explanation of the systolic or presystolic murmur, but not of the bruit de galop, so pass it by as unimportant. But while a definite explanation may be difficult, there can be no doubt that the bruit de galop or some variety of the triple sound occurs most frequently under conditions in which the muscle of the heart-wall suffers apart from valvular disease. Over hearts recovering from poisoning by toxins of diphtheria or typhoid fever, over dilated hearts also associated with interstitial nephritis, arteriosclerosis, excessive indulgence in alcohol or overwork, the bruit de galop is common, and it may also occur in cases of severe anæmia. In all such cases there is cardiac failure, due to impairment of power of the heart-muscle; but we naturally ask why should such weakness lead to the development of an interpolated third sound? It has been thought from its resemblance to an ordinary first sound to be due to asynchronous action of the two ventricles; in other words, it has been considered part of a reduplicated first sound. Most writers, however, strongly refute the idea of the possibility of such asynchronous action of the ventricles. But while this action may not be so impossible as the majority of writers have declared it to be, there is little evidence in favor of it as an explanation of the bruit de galop, and the fact that the abnormal sound frequently occurs without any reduplication of the second sound at the base would seem sufficient to negative such a view.

FIG. 1.



Tracing of heart impulse taken with Dudgeon's sphygmograph when a bruit de galop was present. Respiratory undulations are also present.

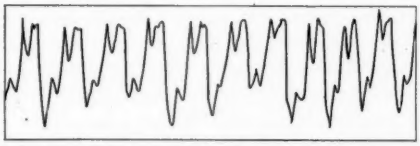
Yet some abnormality of cardiac action is obviously present, an abnormality that shows itself in the character of the cardiac impulse. The hand placed over the heart can, in the majority of cases, easily detect a rise preceding the ordinary impulse, and if the apex-beat is sufficiently forcible a cardiographic tracing gives marked evidence of the same abnormal rise. The following tracings illustrate this fact: the first (Fig. 1), taken from the impulse of a boy, aged fourteen years, with a large heart, associated with adherent pericardium, shows a high wave in the diastolic portion of the tracing. This is perhaps better shown in a tracing taken when the breath was held and the paper was running more slowly (Fig. 2). Both tracings were taken a few weeks before the boy's death, when

a marked bruit de galop was present. Others taken several months previously, on former admissions to the hospital, show no such high abnormal wave in the diastolic portion (Figs. 3 and 4). The bruit de galop was not then present. Other tracings taken from the impulse of the dilated heart of a man, aged thirty years, who indulged freely in alcohol, show the same presence of a high diastolic wave with a bruit de galop.

FIG. 2.

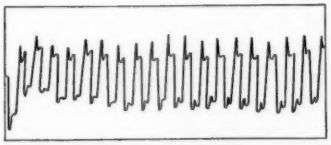
Tracing from the same heart; but breath held, and paper running more slowly.

FIG. 3.



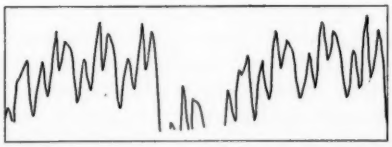
Tracing taken three months previously when no bruit de galop was present.

FIG. 4.



Tracing taken five months previously with Marey's cardiograph when no bruit de galop was present.

FIG 5.

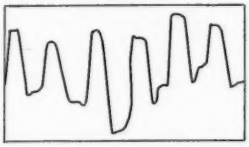


Tracing taken with Dudgeon's sphygmograph from the impulse of a heart when a bruit de galop was present. The larger undulations are respiratory.

Fig. 5 was taken when a bruit de galop was well marked, and Fig. 6 five days previously, when no such abnormal sound was present. These tracings show the association of alteration in character of the cardiac impulse with the bruit de galop and confirm the experience of palpation that an

abnormal rise precedes the ordinary normal upheaval due to systole of the ventricles. To what is this rise due? Potain and others have attributed it to distention of the left ventricle during inflow of blood from the contracting auricle. Distention of the ventricle by contraction of the auricle would explain the diastolic rise, but it is not obvious why that rise should be followed by a fall before the second rise due to systole of the ventricle occurs. One would suppose that the ventricle would remain distended and keep the chest-wall raised until the commencement of the ventricular systole, when a further rise would occur.

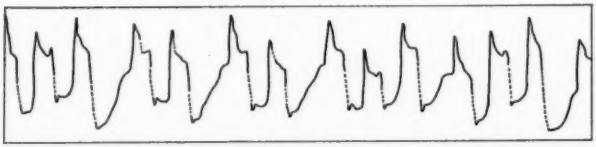
FIG. 6.



Tracing taken five days previously when no bruit de galop was present.

In other words, one would expect to see on a cardiographic tracing a ventricular systolic wave superimposed upon that due to auricular systole, and would not suppose that a deep negative wave would separate them. A glance at the accompanying figure may illustrate this point (Fig. 7).

FIG. 7.



Tracing taken from a heart-impulse with Marey's cardiograph, showing the rise of apex in diastole during intermissions.

It represents a tracing taken from over the heart of the boy already mentioned at a time when the pulse was intermitting, but no bruit de galop was present. During the prolonged diastole of the intermission the ventricle filled and raised the chest-wall, but when the diastole was of ordinary length the blood did not enter in sufficient quantity to produce such a rise. It is noteworthy, however, that the greater diastolic rise associated with the larger entry of blood during an intermission was not followed by a fall, and the tracing consequently shows a positive wave produced by this diastolic rise, with another smaller positive wave superimposed upon it due to systole of the ventricles, but there is no negative wave separating them.

The negative wave, which must indicate a temporary recession of the apex, appears, therefore, to be a marked feature of the bruit de galop

and seems to indicate that some other factor, in addition to mere distention of the ventricles during systole of the auricles, must be at work in producing the abnormal impulse. Dr. Sansom[1] suggests that the inrushing blood first strikes the wall of the ventricle in the neighborhood of the apex, but that afterward a considerable quantity rebounds toward the base behind the great anterior mitral flap. It seems to the writer that some such movement of the blood may occur, but that the explanation given by Sansom is perhaps improbable. The entering blood will possibly in virtue of its inertia strike some regions of the ventricular wall more forcibly than others, but a large orifice with pliable edges like that of the mitral and its flaps is not likely to concentrate the force of fluid travelling through it. The blood will more probably be allowed to obey the laws of fluid-pressure and cause more or less uniform increase of tension within the cavity of the ventricle.

But while we believe that the auricular systole will not concentrate its force upon the region of the apex, it seems probable that this part of the heart-wall will be more exposed to the effect of increased intraventricular tension than other areas. A little consideration will show that the region of the apex is not protected in the way that the base is. In a dilated heart the chordæ tendineæ will be put on the stretch not only during systole of the ventricle, but also probaby during systole of the auricle. Most of these cords run diagonally inward and upward from each muscular pillar to be inserted in both mitral flaps, consequently outward pressure upon the flaps, while it widens the mitral orifice, will tend to draw inward the muscular pillars. These muscular pillars are more or less widely attached to the wall of the ventricle, and it follows that the tension of the entering blood will pull inward rather than force outward these areas of the heart-wall, and thus put a check upon its own distending force. The region of the apex, being the least protected, will tend to dilate most and the ventricle will possibly assume something of an ovoid shape.

That this distention of the region of the apex really occurs can be seen on examination of a dilated heart in the post-mortem room, and better still if the heart be stuffed, placed for a time in some hardening fluid, and afterward a portion of the heart-wall be cut away, the stuffing removed, and the cavity of the ventricle then examined. The bases of the musculi papillares, normally spreading their attachments nearly to the apex, will be comparatively high up on the wall of the ventricle, and the main enlargement of the cavity that has taken place will be seen to be situated below the bases of these pillars, in the region of the apex and lower part of the septum ventriculorum. We may, with some reason, assume that the dilatation in this region is largely due to strain put

[1] Disease of Heart and Thoracic Aorta, p. 212.

upon it during entering of blood from the auricle. The distention that produces this strain will, when palpable through the chest-wall, lead to the appearance of the high diastolic wave we have noticed in a cardio-graphic tracing. The negative wave that follows this high rise needs, however, to be explained. It has been mentioned that during systole of the auricle the mitral flaps are forced outward, and that this outward pushing of the flaps must, through the chordæ tendineæ, tend to draw inward the muscular pillars. The pressure of the inflowing blood will have one other effect. It will by its outward pressure upon the large mitral flap force that flap toward the septum ventriculorum and prevent blood in any quantity travelling upward past it toward the aortic orifice. This position of the large mitral flap and the comparative approximation of the musculi papillares tends, as we have seen, to throw the main distention upon the region of the apex and leads to a rise of the impulse during systole of the auricle. But when that systole is over there is no longer outward pressure upon the large mitral flap and no longer any restraint upon the musculi papillares; intraventricular blood-pressure is left to distend the heart as it will, which intraventricular pressure will cause rapid displacement of blood in the direction of the base, tending to throw the flaps together, and to fill the space between the large flap and the septum ventriculorum. This will cause diminution of blood in the region of the apex, and temporary recession of the impulse, leading to the production of a negative wave on a cardiographic tracing. The movement of the blood we have supposed to take place is the same as suggested by Sansom; but while Sansom attributes it to a rebound from the heart-wall, we have endeavored to show that changes in the position of intraventricular tension are the cause of the movement. We have been considering an abnormal cardiac movement that obviously exists, but it is the abnormal sound that attracts the attention of most observers. While, however, the causation of the ordinary heart-sounds still seems to be in some degree an unsettled question, one can hardly expect to be able to explain the bruit de galop, the abnormal feature of which is the presence of an added sound resembling a normal first sound. Potain believes this added sound to be due to distention of the wall of the ventricle by the auricular systole; Sansom, that it is due to sudden tension of the large mitral flap. Those who believe that the normal first sound of the heart is mainly muscular in origin may perhaps be inclined to accept the former view; those who think it originates in the mitral flap will adopt the latter.

In closing, I think it may be safely asserted that the triple sound occurs when the left ventricle, both ventricles, or sometimes it may be only the right ventricle, is more than normally distended during diastole. It is true that slight affections such as febrile disturbances in children may be sufficient to bring out a faint dull sound audible between the first

and second sounds; but it is noteworthy that in such cases this sound frequently occurs only at the commencement of inspiration, when the ventricles must feel the negative intrathoracic pressure and tend to become more distended than at other periods of respiration, and it is reasonable to suppose that their muscular tone has been lowered by the fever, rendering them unable to cope with the distending forces.

Of the importance of this cardiac physical sign as regards prognosis, only those who have observed it carefully during long periods are perhaps able to express a definite opinion. That importance must, of course, depend largely upon the nature of the heart-failure with which it is associated.

In cases of hypertrophy of the heart without valvular disease the writer has seen the bruit de galop appear and disappear with little apparent alteration of general condition. On the other hand, it has been persistent for weeks and months until death has occurred, and in one instance was the only abnormal sign present where sudden death took place in a patient who was not considered seriously ill.

The fact that the bruit de galop may be sometimes transitory and of no great serious import, at other times permanent and apparently as much to be feared as the diastolic aortic murmurs, should, I think, give it an interesting if not an important place among abnormal cardiac sounds.

THREE CASES OF ESSENTIAL ANÆMIA IN ONE FAMILY—FATHER AND TWO DAUGHTERS.

By Wharton Sinkler, M D.,

AND

Augustus A. Eshner, M.D.,

OF PHILADELPHIA.

The occurrence of a profound degree of anæmia in three members of one family—father and two daughters—with the development of symptoms of posterior spinal sclerosis and a fatal termination in one of the cases, would seem to be sufficient justification for detailing at length the history of this interesting group.

J. S., sixteen years old, who had for a time been a salesgirl in a store, presented herself at the Infirmary for Nervous Diseases, in the service of Dr. Wharton Sinkler, on October 28, 1895, when the following history was obtained:

Her father had died of locomotor ataxia and pernicious anæmia at the age of forty-five years. His history is hereto appended. The mother was living, about forty-five years of age, and was said to be also pallid and weak. On examination at a subsequent time she was found to be

a young-looking woman, whose blood presented no abnormality. A younger brother was well. He proved to be a bright little fellow of five or six years of age, and his blood also showed no deviation from the normal. An older sister had had "weak spells," and had been under treatment at the Infirmary on account of pallor. A report of her illness is included in this paper. The patient herself had never been strong. She had had an attack of acute rheumatism when about five years old, and was at this time in bed for about two weeks. Menstruation first appeared at the age of fourteen years, but recurred with much irregularity, at intervals of four or five months. This function was attended with pain, but the discharge was pale—from its description almost serous—and scanty in amount. The last period had been five or six months previously. The girl had been accustomed to drinking two cups of tea and one cup of coffee daily. As a matter of fact, she admitted that she was unable to obtain an adequate amount, not only of nutritious food, but even of the bare necessities of life, and had been eating but little food.

According to the girl's statement, she had always been pale, although she had at no time observed an acute development or exacerbation. The degree of pallor, however, varied from time to time, somewhat in accordance with her nutritive supply. She improved upon a dietary of meat and milk, and grew worse when deprived of these. She had suffered considerable deprivation for a period of four or five years covering the illness, and the time subsequent to the death, of her father. She complained of excessive palpitation of the heart on exertion or excitement, with presternal pain. A sense of pain, weakness, and soreness was referred to the lumbar region of the spine. The girl always felt tired and was easily fatigued. She had noted staggering in walking and also in greater degree in standing. At times the fingers felt numb, and painful cramps appeared in the calves of the legs. She suffered from recurrent attacks of what she called "biliousness," characterized by impairment of appetite, coating of tongue, disagreeable and bitter taste, nausea, and pyrosis. Vomiting occurred rarely. There was moderate cough, with considerable expectoration, and the sputum was from time to time admixed with dark, clotted blood. The patient had had an attack of diarrhœa two or three weeks before coming under observation, but this had not been repeated. There was no further history of hemorrhage or other abnormal discharge; and there had never been observed subcutaneous extravasations of blood. A pin-prick would be followed by scanty escape of pale blood, almost serous. There was at various times a good deal of abdominal colic The bowels were, as a rule, obstinately constipated. There had been loss of flesh to the extent of nineteen pounds in a period of less than two months, although a gain of eleven pounds had been effected during the preceding summer in the course of a three weeks' stay in the country. There was shortness of breath on exertion and also frequent sighing. Chills occurred at irregular intervals—sometimes two or three in a night, at other times none at all—during a period of six months. These were often followed by a sense of overheating, with dyspnœa at times so intense as to cause a fear of death. There was no undue sweating. The feet did not swell. There was increased frequency of micturition both by day and by night, and the patient thought the amount of urine increased. For a long time there had been frontal headache, together with pain referred to the eyes.

Although the eyes were used but little, there was a feeling of weakness referred to them. Dr. A. G. Thomson examined the eyes and reported the absence of any lesion of the fundus. There was some vertigo. Sleep was poor, the patient being restless and wakeful. So far as the girl knew, she had always lived in dry, well-ventilated houses, and had resided in some six or seven different dwellings during the preceding seven years.

On inspection the girl appeared slender and rather small of stature, though not appreciably emaciated. Her complexion, however, was most striking and pronounced. The color was pale yellowish-brown, almost ashen, while the conjunctivæ were clear and white. The gait was fairly steady, withal a little debilitated. Station was perfectly steady, both with open and with closed eyes. The knee-jerks were active, extensive, and ready; ankle-clonus could not be elicited. The muscle-jerks in the upper extremities were active and vigorous. The action of the heart was rhythmic; the first sound was rather dull and heavy; at the left base a blowing systolic murmur could be heard over a limited area; the second sound of the heart was distinct; a hum could be heard in the neck from the gentle pressure of the stethoscope. The thyroid gland was full, but scarcely enlarged.

The blood was examined by Dr. J. R. Hunt, who made the following report:

The red corpuscles present much variation in size. Both macrocytes and microcytes are to be seen. Some cells show marked distortion of shape—poikilocytosis. The color of the corpuscles generally is pale; some of the smaller forms are dark tinted. The blood macroscopically is watery in consistency and the drop presents pale and red areas. Amœboid movement and a nucleated red corpuscle are observed (?). The erythrocytes number 3,000,000 to the cubic millimetre; the hæmoglobin-estimation is 20 per cent.

Tincture of ferric chloride, ten drops three times a day, was prescribed, and a few days later Blaud's pill of iron sulphate and potassium carbonate, each two and a half grains, was given.

The patient was admitted to the Infirmary on November 9, 1895, and was ordered Fowler's solution of potassium arsenite, five drops three times a day, to be increased at the rate of one drop three times a day. Full diet, including milk, beef juice, and eggs, was also ordered. Besides, gentle massage daily and general faradization were directed. Examination of the blood on December 17, 1895, showed the number of red corpuscles to be 3,936,000 to the cubic millimetre and the hæmoglobin-estimation 39 per cent. The patient improved markedly in color and flesh, but complained often of abdominal pain. She was discharged on January 28, 1896, looking quite like a different person. Her weight had increased from 86 to 94 pounds, and her color was bright and good. Unfortunately the last blood-reports have been mislaid, so that they cannot be cited, but judging from the general appearance of the patient the state of the blood could not have been far from normal.

The sister of the patient whose history has just been detailed, M. S., presented herself at the Infirmary on February 18, 1891, in the service of Dr. Morris J. Lewis, complaining of vertigo, referred more particularly to one side—*i. e.*, the right eye—together with a nervous sensation in the right ear. The erect posture induced nausea, with a feeling of weakness, so that the patient was unable to continue standing. The girl

ate very little—rarely any breakfast. She was constipated and suffered from shortness of breath.

The patient dated all her trouble from an attack of influenza from which she had suffered nearly two months earlier. Menstruation was regular; the color of the flow was thought to be good; the discharge was sometimes profuse; the function was always attended with much pain; and there existed leucorrhœa. The breath was noted to be peculiarly cool. The heart was rapid in action and feeble in force. A hum was heard in the neck, as well as in the cardiac region, with a loud systolic murmur at the apex. The knee-jerk was normal on both sides. The patient presented an appearance of marked anæmia. The mucous membranes were very pale; the ears were waxy. Some fulness of the thyroid gland was appreciable. The skin presented a somewhat sallow appearance. There was slight pretibial œdema. There was no tenderness over the superficial bones. The lips were purplish in hue. The nails were white and flat, without curve. A large, irregular bronzed spot was present on the left breast; and the areola was very dark. The patient was in the habit of eating a good deal of fried food, much bread, and little meat. She was given Fowler's solution, three drops, with tincture of ferric chloride, twenty drops, three times a day, and under this treatment improved greatly in color and general appearance.

S. S., the father of the two patients whose history has already been related, applied for treatment at the Infirmary for Nervous Diseases, in the service of Dr. Wharton Sinkler, on January 12, 1891. He was at the time forty-one years old, and a laborer in the pumping department of the Philadelphia Gas works. He stated that his mother had died after a third paralytic seizure, while his father was still living and well. Three sisters also were living and healthy; two brothers had died in childhood; and one sister had died, it was believed, in consequence of some digestive disorder. There were no other children than those already referred to in this report. The wife had miscarried thrice: once between the birth of the first and second children, and twice between the birth of the second and third. The man had had "typhoid pneumonia" at the age of sixteen years, and again when twenty-seven years old; and each time made a satisfactory recovery. Until two years before coming under observation, he had for eight years suffered from aggravated derangement of digestion, vomiting at least once and sometimes thrice daily, feeling well afterward, but suffering from pyrosis. In consequence he had learned to be careful in regard to food. He denied venereal infection; nor had he noted any cutaneous exanthem or suffered from sore throat or iritis. He smoked but seldom, although he chewed a good deal of tobacco. He used alcohol in moderation. About four years before presenting himself he had in wheeling a loaded barrow, which struck some object, felt as if something had given way in the small of the back. He had to be taken home and for a time was unable to straighten himself. He was put to bed and there remained for about two weeks, suffering no pain unless he moved his body, as in turning. The pain was distinctly localized to the small of the back. The patient seemed to recover perfectly and did harder work afterward than he had done previously.

The trouble for which the man presented himself had begun with a feeling of numbness in the legs about thirteen months before, in the sequence of mental depression due to loss of work; either coincidently

or shortly afterward, numbness appeared also in the finger tips. At about the same time he noticed that he staggered in walking, especially at night, and that he could not control the movements of his legs; but he had never fallen. After a while vertigo was noticed on stooping, with a feeling on the part of the patient as if he were about to pitch forward. At times there was difficulty in buttoning the clothes and in picking up small objects. Walking upstairs occasioned great weakness and exhaustion. The patient had a feeling as if a band were fastened around the waist and the knee. There were no gastric crises and no pain in any part of the body. For a short time the patient had a feeling as if he were walking upon cotton. His general health was good. Considerable complaint was made of frontal headache. The memory was retentive. The eyesight had been failing for a year or more, the greatest trouble in the use of the eyes being experienced in reading at night; there had never been diplopia. The patient had for a period of nearly two months been as pale as when he first presented himself. The appetite was good. There was occasional flatulence after eating. Vomiting occurred only infrequently. The bowels were very costive. The functions of the sphincters were underanged. The patient was easily made short of breath. There was no palpitation of the heart. The feet had not been swollen except for about a week before the patient entered the Infirmary, when they, together with the face, became noticeably swollen. He arose usually once at night to urinate, and had so arisen for some time before his immediate trouble had begun. Sleep was not otherwise disturbed. Sexual desire had been lost for six months, and sexual power was also diminished. There had never been lancinating pains.

The patient was pale, presenting a somewhat muddy tint and waxy aspect. The mucous membranes also were very pale. There appeared to be little blood beneath the finger nails. The pupils were equal and slightly contracted and reacted well to light and in accommodation. There was no appreciable ocular palsy. Both optic disks were exceedingly white; the arteries and veins were intensely pale, the latter pulsating actively. The eyes were hyperopic and astigmatic. The tongue was protruded straight; its papillæ were poorly developed. The spleen was not enlarged. The pulse was quiet and regular, and the tension slightly increased. The first sound of the heart was blurred at the apex, but no distinct murmur could be heard. The gait was somewhat ataxic. Station was good until the eyes were closed, when swaying became quite marked. The grasp of the hand was only fair, but equal upon the two sides. Biceps jerk, triceps-jerk, and muscular irritability were normal and equal in the two upper extremities. The points of the æsthesiometer were differentiated at a distance of half an inch on the dorsum of the hands. The sense of touch was not delayed. Tactile sensibility was impaired on the legs. A feeble cremasteric reflex could be elicited upon the right, but none upon the left. The abdominal reflex could not be developed. The plantar reflexes were diminished. The knee-jerks could not be elicited, even with reinforcement. On the dorsum of the foot the two points of the æsthesiometer could not be differentiated at a distance shorter than three inches. There was prompt response to the touch of the points. The spine was straight and free from tenderness on percussion. Pressure upon the bones occasioned no pain. The patient was directed to take twenty drops of tincture of ferric chloride and five drops of Fowler's solution thrice daily, and on February 11, 1891, he was

admitted to the hospital. The number of red corpuscles as determined at different counts by Dr. C. W. Burr was 2,350,000, 2,700,000, and 2,000,000 to the cubic millimetre, and the hæmoglobin-estimation 35 per cent., 27 per cent., and 30 per cent., respectively. The following additional observations of the state of the blood were made by Dr. Burr:

March 2, 1891. Red blood-corpuscles, 2,325,000; hæmoglobin, 35 per cent.

10*th*. Red blood-corpuscles, 4,125,000; hæmoglobin, 55 per cent.

17*th*. Red blood-corpuscles, 4,475,000; hæmoglobin, 60 per cent.

April 11*th*. Red blood corpuscles, 4,350,000; hæmoglobin, 80 per cent.

The note made on May 18, 1891, reads that the patient had returned to his heavy work in the gas works. He still had some girdle sense and tightness about the waist, but no shooting-pains. The numbness of the feet and soles persisted. The knee-jerks were absent. The station was good. There were no vesical or gastric symptoms. Strychnin sulphate, one thirtieth of a grain thrice daily, was now prescribed.

On September 30, 1891, the hæmoglobin-estimation was 80 per cent., the number of red blood-corpuscles 3,750,000. On January 28, 1892, the hæmoglobin-estimation had fallen to 30 per cent., and the number of red cells to 2,300,000, without poikilocytosis and without increase of colorless cells. It was noted that the red blood-corpuscles varied but little in size. No nucleated red cells were observed.

In February, 1892, the patient went to bed on account of his anæmia, and he remained there for four months. Then he resumed work for three weeks, after which he suffered from a dysenteric condition for three months. Then he worked for another month. For three weeks at this time he had been at home. His difficulty in walking had grown gradually and slowly worse. He had suffered pain in lying on the right side. He was unable to read without glasses, though he had at no time diplopia. Girdle-sense persisted. At times there was dyspnœa. There was almost total inability to button the clothing. Numbness was still present in hands and feet. There was no vertigo. Cramps in the legs were present every morning. The appetite was good, the bowels constipated. Sleep was good. At times the feet became swollen. The gait was very ataxic and the hands had now also become ataxic. There had never been tinnitus aurium. Knee-jerks, elbow-jerks, and chin-jerks could not be elicited. Common sensibility was normal in the hands and there was no wasting. At this time the appearance of the patient was less waxy than at earlier observations. A basic systolic murmur could be heard on auscultation of the heart. The pupils were equal and reactive to light and accommodation. Blaud's pill, five grains, with Fowler's solution, three drops, was now given thrice daily. At the next examination of the blood the hæmoglobin-estimation was 55 per cent., and the red corpuscles had risen in number to 4,800,000 to the cubic millimetre.

The patient was readmitted to the hospital on November 4, 1892, in a markedly ataxic condition. His weight was 111½ pounds. There was no Argyll-Robertson pupil. The knee-jerks were still absent. The patient was put to bed and made a gradual gain in strength up to January 16, 1893, when he weighed 118½ pounds. On January 12th it was noted that the pupils reacted normally to light and in accommodation. There was now, however, partial atrophy of the optic disks, the more marked upon the left. The girdle-pain kept constantly ascending until

it reached about the level of the nipples. On January 17, 1893, the patient had a chill, the temperature rising to 102.8°, but coming down to normal in the course of three days. Suspension was being tried. Coincidently it was found that the knee-jerks reappeared. The patient was discharged not improved on March 14, 1893, and died at his home on May 5th, in a "weak spell." An autopsy was held on May 8th, but the specimen of cord furnished for study was not in condition to permit of satisfactory histological examination.

The last case is of more than ordinary interest for several reasons. When the patient first came under observation he was regarded as a case of locomotor ataxia of somewhat irregular type. The absence of true fulgurating pains and of ocular symptoms showed, however, that it did not belong to the ordinary form of tabes. It seemed probable that the symptoms of disease of the posterior columns of the cord were due to the pernicious anæmia that was present, and this view was supported by the fact that when the patient's general condition markedly improved the tabetic symptoms all changed for the better. When the man was first treated in the hospital there was unusally rapid improvement in the state of the blood, and considerable increase in weight took place. At the same time the disorder of the muscular functions persisted. There were absence of the knee-jerks and unsteadiness in gait. The patient was, however, as stated in the notes, able to return to work and performed the duties of a laborer for several months. Another point of interest in the case is the fact that during the last period of hospital treatment after suspension, which was employed according to the method used in the treatment of locomotor ataxia, there was a return of the knee-jerks.

A number of cases presenting lesions of the spinal cord in conjunction with pernicious anæmia have been placed on record since Lichtheim[1] announced the results of his investigations upon this subject. Burr[2] has detailed seven cases, in only one of which was the cord found normal. He states that the only parts of the cord affected are the posterior columns, the lateral columns in and near the crossed pyramidal tracts, and occasionally the direct cerebellar tracts.

Many of the symptoms present in all three of the cases are suggestive of a gastro-intestinal origin for the anæmia, as the general condition, including the state of the blood, varied directly as the nutritive condition. Whether the spinal changes occasionally associated with profound degrees of anæmia—and symptoms of which were so prominent a feature of the fatal case detailed—are to be attributed directly to the anæmia or to some intoxicant perhaps equally responsible for the anæmia, has not yet been determined; yet it would appear that some such relationship must exist. It may reasonably be admitted, further, that so-called pernicious anæmia may result from a variety of causes in whose train blood destruction is in excess of blood regeneration.

[1] Congress für innere Medicine, 1887. [2] University Medical Magazine, April, 1895.

THE ACTION OF HYDROBROMATE OF SCOPOLAMINE UPON THE IRIS AND CILIARY MUSCLE.

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This special series of experiments, which were conducted upon a great number of young, slightly hyperopic eyes that showed but little or no muscular strain and but slight chorio-retinal irritation, are here offered simply as a contribution to the question of choice of cyclopegics in the careful and correct determination of ametropia; reserving the action of the drug in different amounts upon inflamed ocular tissue to a later and more extended communication.

In this work care has been taken to make these studies under as near the same conditions as possible. Each subject, who was a person of intelligence, was seated in such a manner, with his back to a window with northern exposure, as to place his eye before a well-lighted page of cleanly cut and distinct type that was devoid of any context. One eye was tried at a time, the other being carefully excluded from all participation by several turns of a roller bandage. The exact horizontal width of the pupil, if it were round, or the length of its longer diameter, if it were oval, was carefully obtained. The utmost strength of the power of the ciliary muscles was next gotten in millimeter lengths.

One instillation of a perfectly fresh solution of a neutral specimen of the drug was now made. Notes as to the pupillary dilatation and the recession of the near point[1] were taken every two minutes for varying periods of time averaging from sixty to ninety minutes.

The moment that the half-dioptre type could not be recognized a convex lens of four-dioptres' strength was placed at about fifteen millimeters in front of the eye, care being taken in every instance to include it and its position as regards the nodal point of the eye in all of the ultimate calculations.

The accompanying chart, which is based upon those of Donders, is practically the same as that previously employed by the writer in other similar studies.[2]

Observations. 1. The mydriasis of a single instillation of the one-four-hundred-and-eightieth of a grain of hydrobromate of scopolamine is obtained in eighteen minutes.

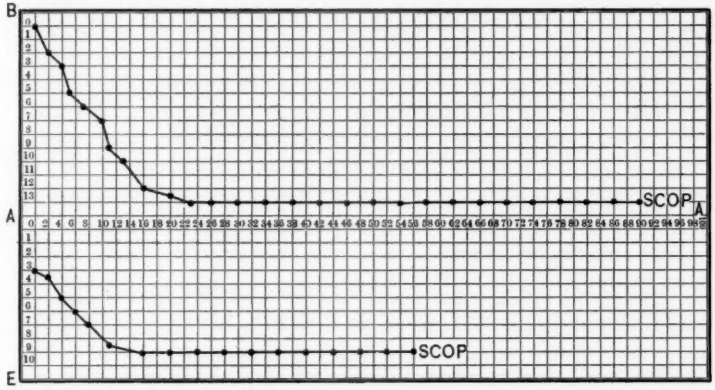
[1] In all of the estimations care was taken to obtain the exact equivalent refractive error before any of the tables were constructed and any of the data were formulated.

[2] Vide articles upon "The Comparative Action of Hydrobromate of Homatropine and of Sulphate of Atropine upon the Iris and Ciliary Muscle," and "The Comparative Action of Sulphate of Daturia and of Sulphate of Hyoscyamia upon the Iris and Ciliary Muscle," in the July, 1881, and July, 1882, numbers of this Journal.

2. The ciliary paralysis of a single instillation of the one-four-hundred-and-eightieth of a grain of hydrobromate of scopolamine is consummated in twenty-three minutes.

3. The single instillation of the one-four-hundred-and-eightieth of a grain of hydrobromate of scopolamine produces full dilatation of the pupil in every instance.

4. The dilatation of the pupil occasioned by the single instillation of the one-four-hundred-and-eightieth of a grain of hydrobromate of scopolamine remains *ad maximum* from twenty-four to thirty hours.



5. The total ciliary paralysis produced by the single instillation of the one-four-hundred-and-eightieth of a grain of hydrobromate of scopolamine is maintained from twenty-four to thirty-six hours.

6. By accurate observations made several times daily after the mydriasis and ciliary paralysis of the single instillation of the one-four-hundred-and-eightieth of a grain of hydrobromate of scopolamine are obtained it is found that the diameter of the pupil becomes normal in about seventy-two hours, and total re-establishment of the power of the ciliary muscle takes place in about ninety-six hours' time.

During the course of experiments with the drug it was noticed:

1. At the beginning of a few of the examinations there was a slight sense of conjunctival astringency which in a couple of instances amounted to a stinging sensation.

2. There were no appearances of constitutional disturbance; care, however, having been taken in every instance to prevent the passage of any of the liquid into the lachrymal passages.

3. In no instance was any apparent increase of a choroidal disturbance produced by the employment of the drug used.

Conclusions. 1. The early and complete paralysis of the ciliary muscle that can be obtained by the single instillation of the one-four-

hundred-and-eightieth of a grain of hydrobromate of scopolamine and the rapid and full return of the action of the muscle render this drug in this amount the most efficient and the most valuable cycloplegic that can be used for the proper determination of the total amount of ametropia.

2. The comparatively rapid return of the full dilatation of the pupil produced by the single instillation of the one-four-hundred-and-eightieth of a grain of hydrobromate of scopolamine to normal pupillary width renders the drug in this strength less objectionable than those drugs which by reason of necessarily greater strengths, to afford proper cycloplegic work, must be employed in amounts that give more permanent mydriasis.

3. The perfect freedom from injurious constitutional effects when the one-four-hundred-and-eightieth of a grain of hydrobromate of scopolamine is used renders the drug in this amount absolutely safe for employment in all cases in which total cycloplegia becomes necessary.[1]

A CASE OF TUMOR OF THE CEREBELLUM IN WHICH OPERATION WAS REJECTED.

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Tumors of the cerebellum, according to the statistics gathered by Mills and Lloyd, Starr, Gowers, and others, are among the most common of intracranial neoplasms. The proportion, in round numbers, appears to be about 25 per cent. They are especially frequent in children and young adults, in whom the prospects for long life should be, as a rule, the best. They are peculiarly disabling, entail extreme suffering, and, unless something can yet be devised for their relief, they are necessarily fatal. Their most common varieties are the tubercular and the gliomata and sarcomata, all of which are decidedly unfavorable, because, first, the tubercular form presupposes a constitutional infection; and, second, the gliomata and sarcomata belong to groups of neoplasms the members of which are likely to be recurrent and malignant. The causation of tumors of the cerebellum, just as of all other

[1] The writer here desires to express his thanks to Drs. Paul Guilford and A. S. Wilson, late resident surgeons at Wills Eye Hospital, and to Dr. Louis H. Préfontaine, Resident Surgeon at the New York Eye and Ear Infirmary, for valuable assistance given during these experiments.

In some of the later experiments the real and the reputed strengths of the drug used were found to vary so much that no reliance could be placed upon the scientific results. Practically, with the drug as now daily employed by the author, the most certain results are obtained in some instances with the one-two-hundred-and-fortieth of a grain.

tumors of the brain, is usually obscure. The tubercular varieties are, of course, the results of systemic infection. The gliomata and sarcomata, however, occasionally appear to be due primarily to trauma. This, to be sure, is usually an obscure question, for the simple reason that injuries to the head, especially blows, are so common, that it is often possible to elicit a history of such an injury without at the same time it being possible for the observer to be certain that such an injury in a given case acted as the true exciting cause. In case, however, such a history can be established, especially if the injury has left a permanent external deformity of the bones of the skull over the region of the cerebellum, the indication and temptation for operation are greatly increased, and the case appeals strongly to the neurologist and surgeon to give the patient any possible chance that may arise from surgical interference.

These considerations arose prominently in the case which I am about to report. The man had received a severe injury to the occipital bone several years before the onset of the symptoms of tumor. This injury had evidently caused a fracture of the external table, at least, and had left a very marked deformity. There was, however, a history of subsequent syphilitic infection. The symptoms pointed to a localization of the tumor at a possibly accessible point, and their onset was so recent at the time the patient first came under observation that it appeared probable that the growth had not made great progress. These facts led to the serious consideration of the advisability of operation; and finally, in consultation with my colleagues, Drs. Mills, Dercum, and Laplace, I had decided to have it done. The date had even been fixed for the operation when circumstances, not directly connected with the case, made it necessary to postpone the day. Before a second date had been fixed the patient's condition changed so much for the worse that, in view of the dangers and uncertainty of all operations beneath the tentorium, the operation was finally abandoned.

This history of the case is as follows:

A. L., aged thirty-eight years, white, male, married, a brass-polisher by trade. His family history was negative. The patient had had syphilis, but denied alcoholic habits. Seven years ago he was struck on the occiput by a fragment of a grindstone which had exploded. The extent of this injury and the duration of his disability from it could not be satisfactorily learned. He stated in general terms that he "soon recovered," but that ever since the accident he had been troubled with violent headaches, which were quite frequent. Five weeks before his admission into the hospital, in February, he began to have a violent shooting-pain, different from his headaches, but situated, like them, in the occipital region. He noticed then that his vision was failing He had also attacks of vertigo, but no vomiting, except once about one week before he came to the hospital.

Upon his admission in February, 1896, the patient was at once seen to have a characteristic cerebellar gait and attitude. His head and

trunk were forced to one side (the right), even when he attempted to sit up in bed. (See Fig. 1.) When he attempted to walk, which he could do only when supported on either side, this forced attitude was still more marked. It seemed as though some power within the patient, not himself, forced his head and trunk to one side. At times, however, this attitude was not so obviously forced, although always to the very end he tended to assume this position when raised in bed.

FIG. 1.

Patient with forced attitude from tumor of the cerebellum.

The patient was almost completely blind, and had dilated pupils. He had a hesitating speech, and the slow cerebration not infrequently seen in cases of tumor of the brain; though rather more marked, in my experience, in cases of tumor of the frontal lobes than in other regions of the brain. The knee-jerks were exaggerated and a slight ankle-clonus, more marked on the left side, was noted. There was no anæsthesia, nor any paralysis of the arms or legs. When lying down the patient had good control of his legs. The muscles supplied by the fifth, sixth, seventh, ninth, and twelfth nerves were not paralyzed. There

was no involvement of the bladder or rectum. The pain was not quite so urgent a symptom as it had been at the commencement. The patient slept and ate well. Vomiting at this time was not marked. There was no history of convulsions. The lungs, heart, and kidneys were normal.

After admission the patient's condition remained comparatively unchanged for some weeks.

The examination of the eyes was made with great care by Dr. Oliver, who reported as follows:

"Ophthalmoscopic examination shows that the pupil of the right eye is five by six millimetres in size, with its long axis at forty-five degrees. The media are clear. There is a marked choked disk, the extreme summit of which is situated down and in and extending forward into the vitreous to six dioptres' height from a two-dioptre fundus. The retina in the vicinity of the disk is swollen. The retinal veins are small and carry dark blood. The retinal arteries are very much reduced in size. The nerve-swelling appears very solid, white, and compact, and stands out in prominent contrast with the swollen retina. Between the macula and the disk and beneath the macula there are a few points of commencing degeneration.

"The pupil of the left eye is the same as that of the fellow-eye, except that its long axis is at one hundred degrees. The media are clear. There is a similar choking of the disk, the summit of the swelling extending seven dioptres into the vitreous from a two-dioptre level of the rest of the fundus. The disk is diffusely swollen, its edges being nowhere visible. The retinal veins are reduced in size except at the summit of the disk, at which place they are engorged with very dark blood. In this position the lower temporal vein curves directly into the substance of the disk and is surrounded by a congeries of fine swollen capillaries and minute capillary hemorrhages, distributed through which there are a number of brilliant crystalline masses. The retinal swelling is more extensive than it is in the other eye and gradually shelves down to the normal retinal plane far out in the periphery of the fundus.

"Vision in the right eye seems to be absolutely lost, while that of the left eye is reduced to the ability to see strong light-stimulus in a contracted and flattened field embracing the fixation-point.

"Careful examination of the irides shows that with the exception of a slight response of the left iris to very strong light-stimulus there is no reaction directly or consensually to light, accommodation, and convergence. The eyeballs are freely mobile in all directions, though when fixation is carried outwardly, either to the extreme right or to the extreme left, a series of horizontal oscillatory movements, that continue as long as the effort at fixation is maintained, are constantly induced."

On March 11th, about four weeks after admission, the man began to have incontinence of urine, apparently due largely to defective cerebration. He continued quiet and apathetic, lying on his back with his head somewhat retracted and deviated to the right. There was but little complaint of pain, even when the patient was roused and his attention called to the subject. A few days later he had several attacks of vomiting, but these were not persistent, and such attacks were never a conspicuous feature of the case.

During all the period of his illness in the hospital close observation failed to determine paralysis of the cranial motor nerves from the motor branch of the fifth down. The action of the seventh nerve especially

was watched and tested, but at no time was the characteristic peripheral paralysis of this nerve observed. The acoustic nerve of one side (the right) was apparently dulled, but I regret that critical tests with the electric current could not be used for this nerve, because of the patient's mental condition. The muscles of swallowing, supplied by the glossopharyngeal or ninth nerve, and the muscles of the tongue, supplied by the twelfth, were never involved sufficiently to be notable. The patient's mental state rendered fine tests for some of these muscles difficult and unsatisfactory Still, the ability to swallow and to protrude the tongue remained good until the end. There was never any anæsthesia in the territory of the fifth nerve, nor on the trunk or extremities.

As the case progressed, during March, the patient became more stupid. He had headache, which was not constant. He answered questions, but slowly and vaguely.

The advisability of operation was discussed with Dr. Laplace, surgeon to the hospital, and later with Dr. Mills and Dr. Dercum. The diagnosis of a cerebellar lesion could not be doubtful, and the indications were all in favor of its being a tumor. The localization was approximately indicated by the forced movement; the tumor was near or in one of the middle cerebellar peduncles—but which one was not certainly indicated. The exemption of the seventh and ninth nerves rather pointed to the growth being remote from the under surface of the cerebellum—and, in fact, my fear was that it was within the fourth ventricle, where most of these tumors that have occurred in my experience have been. The exemption of these nerves was one of the chief reasons for this fear. None of these considerations certainly could have led any one of us to advise operation; but there was one feature of the case that seemed to favor it. This was the injury to the skull. A quite prominent deformity to the right of the middle line was notable on the occipital bone. It seemed almost like an exostosis. It was this lesion, more, I think, than anything else, that led to the determination of making at least an exploratory incision and removing this portion of bone. As said already, however, this operation was at first necessarily postponed, and finally, and as it would seem fortunately, it was voluntarily abandoned.

The patient failed gradually, without further marked change in his special symptoms, until April 10th, when he passed into a stuporous condition, with labored respiration and œdema of the lungs, and died. He never had a convulsion.

The findings at the autopsy were as follows:

Body. Emaciated, but not to a marked degree.

Lungs. Old adhesions of the pleura. Some anthracosis.

Heart. Some hypertrophy of the left ventricle. Heart nearly completely covered by the lungs anteriorly.

Spleen. Small; capsule thickened.

Liver. Normal.

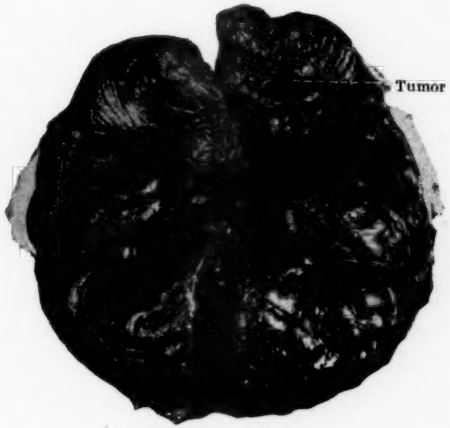
Kidneys. Slight interstitial nephritis. Few small cysts found on the surface of the right kidney.

Brain. Calvarium of usual thickness; on the occipital bone to the right of the median line an exostosis is found, it being external, as the inner table is not affected. Membranes of the brain normal. No œdema. From the under surface of the cerebellum there is a neoplasm lying between the pons and medulla on the one hand, and the right lobe of

the cerebellum on the other. Across its surface course several nerve-trunks, probably the seventh and eighth, stretched and atrophied, further back probably the fibres of the twelfth.

This tumor is oblong in shape, 5½ cm. in length, and 2½ cm. in breadth at the widest part. The growth[1] springs from the middle cerebellar peduncle. The posterior part of the tumor where it lies between the oblongata and the cerebellum is cystic. The anterior portion where it protrudes freely is solid. The under surface of the right cerebellar hemisphere is excavated apparently by pressure of the mass, and in the excavation there is a cyst formed by the membranes. Upon opening the fourth ventricle by cutting through the vermis, it is seen that the fourth ventricle is entirely clear, none of the neoplasm entering it. The tumor

FIG. 2.



Tumor of the cerebellum.

springs entirely from the under and external surface of the middle cerebellar peduncle. The corpora striata and optic thalami are normal. They are not enlarged, but they have not been opened because the specimen is to be kept for hardening and microscopic examination. The spinal cord shows œdema and degeneration of the lateral columns.

Analysis of Special Symptoms. The high grade of optic neuritis seen in this case corresponds exactly to what is usually seen in all cases of tumor beneath the tentorium. This tumor was not in very close proximity to the anterior quadrigeminal bodies or to the optic tracts, and yet blindness was one of the earliest symptoms. This is probably explained in these cerebellar cases by pressure and obstruction of circulation and of the lymph-channels. It is noteworthy that there was almost complete ophthalmoplegia *interna*, but no ophthalmoplegia *externa*. As

[1] The photograph of the brain in this case was made by Dr. C. Y. White, Resident Physician.

the nuclei for the internal muscles of the eye (the iris and ciliary muscles) are known to lie furthest anterior, beneath the Sylvian aqueduct, of all the nuclei for the oculomotor branches it seems rather odd that they should be more involved than these latter. Of course, this paralysis may have been due to the fact that the optic neuritis impaired the reflex arc.

The proximity of the tumor to all the cranial nerves below the fifth and the exemption during life of all these nerves (except the eighth) are also noteworthy. It cannot be claimed for certain that none of them was involved, because the patient's condition did not admit of as exact tests as could be wished—but the trunks of the sixth and seventh on the right side, the latter of which lay apparently immediately across the growth, were certainly not paralyzed. The paralysis of the muscles supplied by these nerves is so conspicuous and unmistakable that it does not seem possible that such paralysis could have been overlooked in a patient so faithfully watched as this man was by all the attendants.

The inference is that these nerves, while still in the posterior cranial fossa, will endure more pressure and abuse than they will after they leave the fossa. This is probably because pressure does not so readily affect them there.

There were no variations in the knee-jerks in this patient such as are reported in some cases of tumor of the cerebellum. These variations, when they occur, are probably due to variations in pressure beneath the tentorium.

The absence of any direct connection between the old lesion of the occipital bone and the tumor is also noteworthy. As can be seen from the specimen, the tumor is quite remote from the part of the skull involved. The bone-injury had apparently been confined entirely to the external table; the inner table and the underlying membranes were absolutely normal.

The tumor is evidently a gliosarcoma which has undergone some cystic degeneration. It has no appearance whatever of being a gumma.

The forced movement, as seen in this case, while highly characteristic of a tumor near or involving the middle cerebellar peduncle, is of little localizing value for the surgeon. This is for the reason that the tumor may just as readily be on the ventricular aspect of the peduncle or even within one hemisphere of the cerebellum near the peduncle, as on the outside of the cerebellum. It does not seem certain, moreover, as yet, from these forced movements, which peduncle is involved. In the majority of cases the movement is *away* from the side of the lesion. In my case it was toward this side.

The question of surgical interference in cases of tumor of the cerebellum does not often arise, for the excellent reason that in all these

cases such a proceeding must be largely experimental and most hazardous. In the case here reported it seems clear to me, in the light of the autopsy, that the result would inevitably have been fatal. The difficulty of localization sufficiently exact for surgical purposes must always be very great, and the technical difficulties, we may well suppose, will baffle the best and most self-possessed surgeon in most of these cases. In a recent case, Gerster,[1] of New York, attempted to remove a cerebellar tumor, which was afterward found post mortem to be in a position very similar to that of the tumor in my present case, but he was entirely unable even to get near to it. He made his incision through the skull above the attachment of the tentorium, along which runs the lateral sinus, intending to raise the occipital lobe and to reach the cerebellum through an incision in the tentorium; but he was prevented by the great pressure from within the posterior fossa and by an immense cerebral hernia. His patient died in two weeks.

DIAGNOSIS OF CHRONIC ABSCESS OF THE BRAIN.

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(Concluded from page 190.)

The following case,[2] coming on after an attack of influenza, a possible cause of cerebral abscess, and presenting symptoms of meningitis, was due to an unsuspected vascular lesion which proved fatal:

J. N., aged thirty years, white, a boiler-maker by occupation, whose family and personal history was not obtainable, suffered from la grippe about four weeks before. He was greatly reduced by the attack, but no localized lesion was found. He had gradually recovered, so that he anticipated returning to work in a day or two, but he was still weak and languid. On the morning of the 17th of April, 1895, about thirty-six hours before I saw him, he awoke and was talking with his wife, when suddenly he put his hand to his head and cried, "Oh, my head!" Soon after this he lost consciousness, but he rallied in the course of a few hours and talked some during the day, but seemed dull and stupid and complained of pain in his head. The next morning he was nearly unconscious, but in the afternoon he was able to talk with his wife, and seemed rather bright. The temperature, Dr. Richmond reported, had appeared normal, although he had not registered it. When I entered the room, at 5 P.M., he observed and spoke to me, and said that his

[1] American Journal of the Medical Sciences, May, 1896.
[2] Irrigation of the Posterior Cerebral Fossa for the Relief of Basilar Meningitis. Journal of Nervous and Mental Disease, Nov, 1895.

head was paining him. He looked depressed and appeared to be suffering. Pupils were small, but responded to light. The posterior cervical muscles were rigid and the head slightly retracted. After I had been in the room examining him for two or three minutes he became unconscious, and I found it impossible to arouse him The temperature was 98.3° F. in each axilla; pulse 72; respiration 16. The knee-jerks were slightly increased. The ophthalmoscope showed no ocular change, and there was no evidence of paresis or paralysis of any muscles. The history of la grippe, the prolonged convalescence following it, and the sudden development of head-pains with normal temperature made me apprehensive of cerebral abscess, although no discharge was observed from either ear, and his wife stated that he had had no ear-trouble. On removing him to the County Hospital two hours later, his temperature was found to be 100.4° F. in the right axilla, 100.2° F. in the left, and 100.4° F. in the rectum. The rise in temperature was thought to be due to the disturbance caused by removing him to the hospital. He did not seem to be totally unconscious; his eyes would follow me or the lamp around the room; when asked his name he endeavored to give it, and succeeded in doing so in an indistinct manner. I asked Dr. Rogers, the attending surgeon at the hospital, to see him with me at 9 P.M. The temperature then registered 99° F. in the right axilla and 99.2° F. in the left; pulse 60; respiration 16; retraction of the head was well marked, and on my attempting to bring the head forward, it seemed to give some pain. The diagnosis at this time seemed to rest between meningitis and cerebral abscess. The retracted condition of the head indicated irritation of the meninges in the posterior cerebral fossa, but the normal temperature at the time of my first visit, and its again descending after he had been resting a few hours in the hospital, seemed to militate against the presence of meningitis. That night his temperature was registered in each axilla every two hours, and the average temperature for the night was 98.4° F., being about the same in each axilla. At 9 o'clock the next morning the temperature in each axilla was 99° F.; pulse 64; respiration 18. He was becoming more stupid, pulse was occasionally irregular and respiration at times intermittent. At noon, when Dr. Rogers again saw him with me, his condition remained about the same as it had been during the morning, but we could find no indications for operative procedure. During the afternoon his temperature varied from 98.6° to 99.4° F.; pulse 63; respiration 18. It was quite evident that there was pressure in the posterior fossa, especially around the pons and medulla. The low temperature contraindicated meningitis, although normal or subnormal temperature is sometimes observed in this disease. Abscess of the brain did not seem likely, as the temperature had been found constantly a little above normal most of the time for the twenty-four hours he had remained in the hospital. During the afternoon he seemed to be sinking into a deep comatose condition, and it was evident that life could not be prolonged many hours unless relief of pressure on the pons and medulla was effected by surgical means. I could be positive of but one thing, and that was pressure at the base of the brain in the posterior fossa. A button of bone was removed from the posterior cerebral fossa of this patient, and the parts irrigated for the relief of cerebral pressure, the patient subsequently dying.

Autopsy eleven hours after death by Dr. Leonard Freeman, pathologist to the hospital: The wound had healed without the formation of

any pus, and no abnormal adhesions between the dura and the bone were detected. The external surface of the dura presented a healthy and glistening appearance. The pia over the convex surface exhibited no marked changes except engorgement of the veins. No clots were found in the venous sinuses. The arteries at the base of the brain presented evidences of disease in their walls, and in the main branch of the left middle cerebral artery, just before the cortical vessels are given off, a clot was found which blocked up the entire calibre of the vessel. In the centrum ovale of the left frontal lobe a considerable quantity of semi-fluid blood was found, which, after ploughing up and destroying a considerable portion of this part of the brain, ruptured into the lateral ventricle and filled the lateral, third and fourth ventricles. The corpora striata were softened A slight hemorrhagic extravasation was found in the right frontal lobe. The remainder of the brain presented a normal appearance. There was no evidence of any meningitis, nor of abscess. The pathological condition was one of hemorrhage into both frontal lobes, the greater in the left, the blood finding its way into the lateral ventricles, and filling these, together with the third and fourth ventricles.

The case just reported presented symptoms before death that were difficult to interpret. At the time of my first visit the normal temperature, dazed appearance, and retraction of the head, following a prolonged convalescence from an attack of la grippe, suggested the possibility of cerebral abscess complicated with cerebro-spinal meningitis. It may be thought that the sudden onset of the cerebral symptoms should have suggested cerebral hemorrhage; but we know how common it is for a cerebral abscess to be unsuspected until it ruptures into the ventricles, when the symptoms simulate those of hemorrhage into the cavities of the brain. A large hemorrhage into the ventricles is so commonly attended with a subnormal temperature at first, and a few hours later by a considerable rise of the temperature, that the case did not appear like one of cerebral hemorrhage. Further, the man's age was against the probability of hemorrhage. The subsequent history of the case after the patient was admitted into the nervous wards of the hospital soon made me give up all thoughts of a cerebral abscess and led me to regard it as a case of cerebro-spinal meningitis. The sudden loss of consciousness, followed an hour or two later by a return to a conscious condition, and after this consciousness and unconsciousness alternating one or more times, were difficult to explain before death.

The normal temperature at the time of my first visit may probably be explained by the irritating influence of the blood in the lateral ventricles counteracting the depressing effect of the hemorrhage into the anterior lobes of the brain. The condition of alternating consciousness, in the light of the post-mortem results, is probably explicable from the fact that hemorrhage first took place in the substance of the left anterior lobe, which probably gave rise to loss of consciousness. After reaction from this consciousness probably returned, and subsequently when the

blood burst into the lateral ventricles, consciousness was again lost. As this process of filling the ventricles was evidently a gradual one, from the fact that depression was no greater, consciousness returned while this was going on, and it was not till the lateral ventricles became completely distended and the blood had found its way into the fourth ventricle that consciousness was finally lost.

Hemorrhage into the frontal lobes of the brain is of extremely rare occurrence, and hemorrhage in a man so young as the patient whose case has just been reported is extremely infrequent. A hemorrhage into the centrum ovale external to the great ganglion, and then bursting into the lateral ventricles, would have found its way so readily into the cavities of the brain as to overwhelm the vital forces of the patient and cause a profound shock, such as is commonly witnessed in ordinary intraventricular hemorrhage. The retraction of the head was due to blood in the fourth ventricle, and the serum of the blood which had found its way around the pons and medulla into the posterior fossa came from the blood in the fourth ventricle.

The case throughout its clinical history was a most puzzling one, and a positive diagnosis was not attempted. It was quite evident that there was irritation in the posterior fossa, and that in this portion of the brain pressure was increased; but beyond this I would not be positive, though the most likely thing that would account for it seemed to me at the time to be a basilar meningitis with exudation around the pons and medulla.

We meet with cases whose symptoms are apparently best explained by a vascular lesion, but at the autopsy an unsuspected cerebral abscess may be found, as occurred in a man whose history is as follows:

J. S., aged seventy-five years, white; widower for a number of years; born in Ireland; by occupation a laborer; of large physique; in Colorado since 1870, was admitted to the Arapahoe County Hospital, January 22, 1895. Family history, so far as I was able to learn, was unimportant. His health in childhood was good, and he had no serious illness until his seventieth year. He had indulged rather freely in alcohol, but during the last five years he had rarely drank. He denied syphilis, but suffered from gonorrhœa twenty years before. He received a bullet-wound in the left shoulder while in the army, in 1861. With the exception of the time during which he was disabled on account of the wound, he said that he was never sick a day in his life until twelve years ago, when he was kicked on the left shin. The injury to the left leg was followed by great pain, and later a large ulcer developed, which nearly healed at times, but for a number of years he had had a large open sore on this leg. One month before coming to the hospital, however, the ulcer completely healed, leaving a large dark-colored, rough cicatrix which was very tender to pressure. For some years he had suffered from vague rheumatoid pains in the legs, especially in the knees and ankles, and in the entire left leg he had had a feeling of numbness for about five years. This leg seemed to him awkward, but he was able to walk with the use of a cane. For a number of months there had been a partial inability

to control the bladder; frequently he would soil the bedding and his clothes, and had to evacuate the bladder several times during the night. The patient said that he was struck over the lower portion of the back and nates by a cable-car early in January of the present year. He was able to rise and walk immediately after, and he did not think he had sustained much injury, although pressure over the lower portion of the back gave him considerable pain. Since the accident he had lost all control over the bladder, and the left leg had been very weak. The left arm, he had noticed, was weaker than the right. He had been obstinately constipated for a number of months. The condition of the right pupil, which was widely dilated and immobile, was the result of an injury which he had received eleven years ago to this eye.

Examination, January 22, 1895. He is unable to stand on account of the weakness of the left leg, and the examination has to be made while the patient is lying in bed. An old scar is observed on the anterior surface of both legs below the knees. They are evidently the result of old ulcerations. The arteries of the extremities are hard and unyielding. The left leg is very weak, but he can move this leg at all the joints, although the power is feeble and the movements are ataxic. The ankle-muscles of the left leg are weaker than those of the knee, and the latter are weaker than those of the hip. Muscular power seems to be fairly good in the right leg; the left arm is weaker than the right: Dyn. R., 100; L., 40. There is slight rigidity in the left arm, with tendency to hold the arm close to the side of the chest, and flexed at right-angles at the elbow. His mental condition seems feeble, concentration of his mind is very difficult, and it is almost impossible to keep his attention on one subject more than a few minutes at a time. There is considerable loss of sensation throughout the left side, apparently more pronounced in the arm and leg than in the face. The knee-jerks are present; the left slightly increased, while the right is less than normal. Plantar reflexes and tendo Achillis are present; ankle-clonus absent; cremaster and abdominal reflexes are absent. The external ocular muscles seem to act normally. The right eye is cataractous, the pupil being widely dilated and does not respond to light or accommodation. The left pupil is very small and does not respond to an active mydriatic, so that an examination of the fundus of either eye is impossible. There is apparent hemianopsia of the left eye; the fields could not be tested in the right eye on account of the presence of a cataract. The mental hebetude was too great to permit of an accurate examination of the special senses. The temperature is 98.2° F.; pulse 60; respiration 24. During the first week of his stay in the hospital his temperature varied from 98° to 99.2° F., usually being about 98.4° F. in the morning, and 98.8° to 99° F. in the evening; the pulse ranged from 54 to 90, only falling to 54 on one occasion, to 60 on three, and to 66 on two, the usual variation being from 72 to 88; respiration varied less than the pulse, ranging, except on two evenings, from 18 to 20. A record of the temperature, pulse, and respiration was made twice daily. During this week he gradually failed, both mentally and physically. He soon lost all continuity of thought, and his mind was a complete blank for any event of recent occurrence. He ate but little; he emaciated rapidly, and passed the discharges from the bladder and bowels into the bed. The second week, from January 29th to February 4th, there was a gradual failure. The temperature ranged between 98° and 99.4° F.; pulse between 60 and 80; respiration

between 18 and 20. During the third week prostration increased rapidly, and his mind became a total blank. The temperature was a little lower than during the preceding week, rising above 98.4° F. only once, when it reached 100° F. one evening, but most frequently it registered 98° F. The pulse varied from 70 to 96, averaging about 80, and was weak and compressible; respiration ranged from 20 to 36. The rigidity of the left arm- and leg-muscles became more pronounced. On February 12th he passed into a deep comatose condition, and the muscular rigidity began to relax, and at 5 P.M. the temperature was 99° F.; pulse 100; respiration 24. The next morning at 7 o'clock the temperature had reached 101.4° F.; pulse 120; respiration 40; and at 5 P.M. the temperature was 105° F.; pulse 130; respiration 36. He died during the night.

Autopsy. The post-mortem examination was made about twenty hours after death by Dr. Leonard Freeman, pathologist to the hospital. The dead-room was cold and the body thoroughly frozen. Unfortunately, only the contents of the cranial cavity were examined. The adhesion of the dura to the bone was not abnormal. The membranes and cortical surface of the brain, neither on the convex nor on the basilar surface, showed any evidence of disease. The vessels were atheromatous, but not to a pronounced degree for one seventy-five years old. On sectioning the left cerebral hemisphere, no gross pathological changes were found, but in the right hemisphere an encapsulated cavity about two inches in diameter, containing a foreign substance presenting almost the identical appearance of orange water-ice, was found in the centrum ovale of the parieto-occipital region. The greater portion of the pathologic process had taken place in the occipital lobe. The lateral ventricle had not been broken into, but only a very thin partition of brain-substance intervened between the cavity and the posterior horn of this ventricle. None of the cortical substance of the brain had been directly involved by the foreign substance, which occupied a position so as to exert pressure on the right internal capsule. No evidence of gross disease was found in any other portion of the brain. In the frozen state it was impossible to determine whether the lesion was a cyst or an old abscess. On melting the icy contents of the cavity they presented the appearance of a watery straw-colored liquid, and seemed to be the result of a cyst; but the microscope showed numerous granular and broken-down pus-cells, proving the lesion to be a chronic abscess. There was no odor. After warming the brain the right hemisphere was found to be much softer than the left; but the extent of the ante-mortem softening could not be determined, as brain-substance softens so rapidly on warming it after it has been frozen.

Although I had an opportunity to study the above case for a period of three weeks, the presence of an abscess of the brain had not been suspected before death, and finding one at the autopsy was a great surprise to me. The age of the patient, the atheromatous condition of the radial arteries, and the comparatively sudden onset of the symptoms of cerebral softening, led me to suspect and to diagnosticate arterial thrombosis. The temperature was normal or nearly so, as is common to abscess or slow necrotic softening taking place after occlusion of a cerebral artery. I regret that I did not make a careful comparison of the temperature in each axilla. It is probable that the temperature would have been found

higher on the paralyzed than on the unaffected side. In hemiplegia from necrotic softening it is likely that this difference of temperature in the two axillæ does not exist to a marked degree, and when present is not persistent, except possibly when the lesion causing the softening is an irritative one, as sometimes happens in acute softening from obstruction of large vessels. The history of a fall did not militate against thrombosis, as the head did not appear to have been injured at the time, and it is not infrequent for occlusion of a cerebral artery in the aged to be preceded by increased physical exertion, which may or may not be a determining factor in the final closure of a narrowed vessel. As it was impossible to obtain a view of the ocular fundi, the condition of the disks could not be ascertained. The absence of headache was in favor of a vascular lesion, and against abscess or tumor. In a man seventy-five years of age the sudden occurrence of a hemiplegic lesion, without headache preceding or following it, in the absence of a growth, or the history of one, in other portions of the body, the presence of tumor of the brain is not suspected. While no age is probably exempt from abscess of the brain, the infrequency with which it occurs in extreme old age made it improbable that I should meet with it in a man seventy-five years old. Of 223 cases of abscess of the brain tabulated by Gowers in his work on the *Diseases of the Nervous System* only one was found at the seventieth year or over. There was no discoverable cause for cerebral suppuration. There was no discharge from the ears, or history of any; the nose appeared to be free from infective material; and no evidence of purulent substance in the thoracic or abdominal cavity was detected during life. In reviewing the history of the case, after the autopsy revealed an abscess of the brain, it has occurred to me that the large open sore on the leg might have furnished infective material with which the brain-substance became infected. The ulcer had troubled him for a period of twelve years, but it had entirely healed, he said, a month before he came to the hospital. The appearance of the cicatrix indicated that the sore had been healed several months. As his memory for recent events was greatly impaired on his entering the hospital, it is probable that events that occurred months or years before appeared to his mind of a later date. This loss of time-sense is common in dementia, especially of the senile variety. We must remember that the left leg had appeared numb, weak, and awkward for a period of five years, and for a number of months he had lost partial control of the bladder. The capsule and its contents indicated that several months, at least, had elapsed since cerebral suppuration took place. What part the blow to the lower portion of the spine had to do with causing the abscess, it was impossible to say. No tenderness of this portion of the spine was detected at the time of my examination. If the blow occurred only two weeks before he entered the hospital, as he stated, it is quite evident that

it played no part in the causation of the cerebral suppuration; but, as before stated, his time-sense for recent events was impaired, and no reliance could be placed upon his statements relating to time, especially for things of comparatively recent date. Had the diagnosis of cerebral abscess been made on the patient's admission to the nervous wards of the hospital I should have recommended and urged a surgical operation, as no hope could be entertained without the evacuation of the abscess, although the extreme age and prostration of the patient would have lessened the probability of recovery.

Not infrequently the history obtained from the patient is sufficiently inaccurate to be misleading. In such cases the corroborative testimony of the friends may aid in arriving at a correct diagnosis.

A man, aged about thirty years, came under my care a few months ago, and reported that he had been suffering from headache for two or three months. His habits had been dissipated; he had indulged in alcohol and venery to excess, and had contracted syphilis some years before. He gave no history of a fall, a blow to the head, otorrhœa, or injury of any kind. He had been treated for typhoid fever for a number of weeks previously to my seeing him, and had emaciated considerably. On examination I found the left arm and leg were weak, and that his mind was clouded. There was lessening of all sensory phenomena on the left side, and a complete left bilateral homonymous hemianopsia. The Wernicke pupil was absent. A few hours later he became stuporous, soon passed into a comatose condition, the left leg and arm became rigid, and the flexor muscles contracted. The left side of the face soon appeared paretic, and the tongue was protruded slightly to the left of the median line. He lived about three days and died in a comatose condition. The first two days his temperature was normal or subnormal; the pulse and respiration were exceedingly slow. The day of his death the temperature was quite high, reaching 104° to 105° F., and the pulse and respiration were frequent. With this history it seemed to me that the most probable condition was one of syphilitic growth in the brain, especially when taken in connection with the choked disk which was present in each eye, but the swelling was not extreme. Thrombosis of a cerebral artery was excluded on account of the presence of the optic neuritis, and nothing but the subnormal temperature and the peculiar rigidity suggested an abscess of the brain. The lesion was located in the centrum ovale, involving the occipito-sphenoidal region. After the patient's death, and before the autopsy was held, it was learned through his brother that some time preceding his fatal illness he had had a fall and struck upon the head; after this he was dizzy and suffered from headache for a time, and even after returning to work his head felt uncomfortable. With this additional history an abscess was made probable, and at the autopsy a large encapsulated abscess was found in the centrum ovale on the right side, involving the occipital and temporo-sphenoidal lobes. The whole of the right side of the brain was œdematous.

It is well known that trauma of the brain may excite into activity latent syphilis of the brain, and the diagnosis between abscess and syphilis of the brain may become a most difficult problem to solve in syphilitic

subjects who suffer from an injury to the head. In this case the paresis of the left leg and arm when I first saw the patient, followed by the rigidity of the muscles, indicated an abscess rather than a tumor, as the rigidity denoted extensive softening, which is more common to the former than to the latter.

Some cases of brain-lesion may improve under antisyphilitic treatment for a number of months, and then relapse after the treatment is suspended, and again improve from the same treatment, and yet at the autopsy an abscess and not a tumor will be found.

A case of this kind came under my care more than a year ago. The patient was a man, a tailor by occupation, whose habits had been bad. He was a free drinker; had suffered several times from gonorrhœa, and had contracted a hard chancre about ten years before. He had never been the subject of traumatism. About eighteen months before I saw him he suffered from a severe cold, which was followed by purulent bronchial expectoration. Soon after this he began to complain of headache; his general health failed, he lost flesh and strength, and his mental power was lessened. On consulting a physician, because of his syphilitic history and head-pains, he was placed upon potassium iodide for a number of months; his headache decreased, but did not entirely disappear; he continued rather weak; appetite poor and vacillating; bowels constipated; and he was unequal to his work, both mentally and physically. He continued in this condition of impaired health for more than a year, when his headache again increased, mental confusion became greater, and he felt a sense of physical prostration almost continually. He slept poorly, became very much emaciated, and his headache at times was agonizing. He was again treated for syphilis of the brain, and again temporarily, but only slightly, improved in health. His condition became miserable, but he did not especially attract the attention of the remainder of the lodgers in the house where he was staying. After passing a restless night, he arose in the morning to dress himself, but before his toilet was completed he fell to the floor, and when found a few hours later he was mentally confused and unable to rise to his feet, the entire left side being almost completely paralyzed. When I saw him, a few hours later respiration was slightly stertorous; his temperature was about 1° F. subnormal in the right axilla, and one-half degree subnormal in the left; pulse 60, full and strong; respiration 12 per minute. On arousing him he seemed for a moment to appreciate what was said to him, but if left alone he almost immediately relapsed into an unconscious state. The left arm and leg were almost completely paralyzed, the paralysis being deeper in the leg than in the arm; the face did not seem to be affected. The tongue was protruded in the median line. No satisfactory test could be made of the general sensory phenomena on account of his blunted mental condition, but, so far as I was able to determine, sensation was less acute on the left side than on the right. The knee-jerks were increased, the left to a greater extent than the right; plantar reflexes were absent; ankle-clonus was slight on the right and well marked on the left side; cremaster and abdominal reflexes were barely perceptible on the right side, and absent on the left; pupils were equal in size, rather widely dilated, and reacted to light feebly; there was no paralysis or paresis of the external ocular muscles; both optic nerves were slightly atrophied,

with some swelling of the disks; the choking of the disk was greater on the right side than on the left; there was apparent left bilateral homonymous hemianopsia, but it was difficult to test the visual fields accurately; the urine was free from albumin and sugar; the heart presented no evidence of disease; and mucous râles were heard in the lungs. No headache was complained of spontaneously, but on arousing him and asking him if he had any pain, he said "Yes," and pointed to his head. Stupor gradually deepened into coma, and he died a few hours later. At the autopsy an encapsulated, chronic abscess in the centrum ovale of the right side was found, involving the occipital and temporo-sphenoidal lobes. The pus was thick, greenish and offensive, and the entire right side of the brain presented an œdematous appearance. No pathological changes beside these were found in the brain. Permission was not obtained to examine any portion beside the head.

It is impossible to discuss the probabilities of arriving at a diagnosis soon after the formation of the abscess, which possibly dated back some fifteen or eighteen months before the patient's death, and about the time of the beginning of the head-symptoms, following a purulent discharge from the lungs. When I first saw the man, a few hours previous to his death, the diagnosis lay between a vascular lesion, tumor, and abscess. The eye-symptoms were sufficient to exclude a vascular lesion. The syphilitic history and the marked amelioration of symptoms from the use of potassium iodide pointed to a tumor of syphilitic nature; but the choked disks presented less swelling than is commonly observed in cases of progressive tumor of the brain. In the *Medical News* for March 10, 1894, I reported a case whose history was somewhat similar to that of this. In it the swelling of the optic disk was well marked and a tumor was diagnosticated, and the accuracy of the diagnosis was verified by the autopsy. In the present instance, notwithstanding the strong probabilities of a syphilitic growth, the history of a purulent bronchial discharge immediately preceding the development of cerebral symptoms, and the slight swelling of the optic disk, determined me to venture the diagnosis of a chronic abscess.

Quite recently I put on record the case[1] of a little girl who was referred to me by Dr. McNaught. She was eleven years of age; had suffered for a length of time from otorrhœa, suppuration in the groin, probably a psoas-abscess, and had sustained a severe injury to the head from a fall, all causes of cerebral abscess. She became the subject of epileptic seizures during which she did not lose consciousness; the convulsive attacks were attended with retraction of the head, at times with opisthotonos, tetanic rigidity of the arms, and frequently with shock-like movements of the arms. There was complete atrophy of the optic nerves, and no evidence of an exudate was apparent in the eyes when I saw her, which was several years after the head-symptoms first became manifest, and some time after blindness, almost complete, had developed. At the

[1] Tumor and Large Cyst of the Cerebellum, with Symptoms Extending over Several Years. Medical Record, August 17, 1895.

autopsy a large cyst, connected with a small tumor of the left lateral lobe of the cerebellum, was found. A more definite diagnosis than that of organic disease affecting portions of the brain in the posterior fossa was not ventured during life. The history of the seizures without loss of consciousness, talking and throwing the arms wildly around throughout the attack, with distinct clonic convulsive movements and opisthotonos, at first suggested hysteria; but this was easily excluded by the optic nerve atrophy and certain vascular changes in the fundi. If these had not been sufficient to enable me to diagnosticate an organic lesion, the attacks that I witnessed would have been ample evidence of such changes. The posterior neck-muscles were rigid as cords; the head was retracted, the spine arched backward, and the masseters, at times, were firmly contracted, so that when she attempted to speak her teeth, which she was unable to separate, were simply uncovered by the lips, and the arms, rigidly extended, were thrown wildly around, with shock-like convulsive movements. Three morbid processes were considered in the diagnosis, namely, abscess, tumor, and the results of an old basilar meningitis. The history of a bilateral otorrhœa with a very offensive discharge from the ears, occurring about the time of the commencement of her first symptoms, which were attended by a convulsion; the suppuration in the right groin, the origin of which could not, when I saw her, be determined, as there had never been any further evidence of caries of the spine; and the blow to the head received just previously to the convulsive seizures becoming frequent, from an etiological standpoint, were about as strong evidence in favor of cerebral suppuration as one expects to find. The subnormal temperature during the first few days of my observation of the case was in favor of chronic cerebral abscess. The otorrhœa had ceased for a period of nearly ten years, and during this time the child had never complained of pain in the ears. It seemed to me, then, that, if the little patient was suffering from abscess of the brain, the probabilities were against the ears having been the source of the septic poison, as even chronic abscess due to ear-infection rarely runs a very prolonged course. Headache is common to all the pathological processes under discussion. The optic nerve atrophy, without any swelling of the disks, was in favor of chronic meningitis and against the presence of a growth or abscess. I felt inclined to exclude intracranial suppuration, but I confessed to the physician with whom I saw the patient in consultation, that I had not sufficient reason to be positive in my opinion. Between meningitis and tumor I was unable to decide. One of these morbid processes would have accounted for some of the symptoms, while the second was necessary to explain the others. Almost total loss of sight, with optic nerve atrophy and seizures attended with opisthotonos, rigidity of the muscles, tonic extensive spasm of the extensors of the limbs, especially of the superior ones, and the shock-like movements of the arms, are found in meningitis of the posterior fossa when the surface of the pons is irritated. So far the symptoms and theory of meningitis harmonized, but I was at a loss to account for other cranial nerves than the optic escaping. That the child at times should feel quite well, and be entirely free from headache or any apparent discomfort, and that there should be no rigidity of the posterior neck-muscles, except during the paroxysms, seemed to me inconsistent with the theory of an old meningeal exudate in the posterior fossa. A tumor in the cerebellum so situated as to produce remittent pressure on the pons, with distinct paroxysms

of increased pressure, is common to the experience of every one who has studied and observed persons suffering from cerebellar growths; but for the pressure-symptoms to be apparently completely intermittent, and to recur with as much regularity as epileptic seizures, without loss of consciousness or mental dulness, was new to me in my experience of cerebellar growths.

In the light of the autopsy, which revealed the presence of a large cyst and a small tumor in the posterior three-fourths of the left cerebellar hemisphere, are the symptoms explicable? It is possible, owing to the watery contents of the cyst, that the pressure exerted by the cyst after it became chronic, on the adjacent structures, was not so great as results from a more solid and unyielding tumor, so that, while there might have been a papillitis during the early stages of the growth, the lessened pressure after the formation of the cyst and the breaking down of the growth allowed this to subside with the resulting atrophy of the optic nerves, and time had permitted all intraocular exudate to be absorbed. We know that a growth in the cerebellum, from its effects upon the circulation of the veins of Galen and adjacent veins and sinuses, disturbs the function of the pons and medulla, usually to a slight extent, continuously, and, when it has reached sufficient size to exert pressure on the respiratory and neighboring centres, by paroxysms, threatening life by increased pressure, which probably results from temporary œdema of the parts. In the case of a cyst, with yielding contents which may vary in quantity from time to time, the pressure-symptoms probably may become intermittent. The peculiar tetanic spasms were most likely due to temporary irritation of the pons and medulla.

With the information gained from the clinical and pathological observations of this case, could error be prevented in the diagnosis of a somewhat similar one? If a large cyst of the cerebellum is attended with more varying pressure-symptoms than a tumor, a problematic diagnosis might be ventured, and it might, or might not, be correct. The only unilateral symptom in the case was the tendency of the right arm and leg to become a little more rigid than the left, with, at times, a turning of the head and eyes to the right; but this was inconstant and of little localizing value in determining which hemisphere of the cerebellum was affected. Had it been possible to localize accurately the lesions, the tumor, in all probability, could have been removed, the contents of the cyst evacuated, and the life of the patient saved. A careful study of the case just reported demonstrates how meagre and unsatisfactory are the symptoms, even of an extensive lesion in one lateral hemisphere of the cerebellum, and that ataxia from lesions of this portion of the brain probably only occurs when they are situated so as to exert pressure on the pons, usually through the medium of the middle lobe of the cerebellum.

It will be seen by a careful study of the cases that I have reported in

this paper that, in the diagnosis of chronic cerebral abscess, while one must be careful to study every symptom, together with the apparent etiology, too much stress must not be laid upon either. Chronic otorrhœa, a blow to the head, and suppuration in a distant portion of the body, were found in one of my cases, yet the patient died from cyst and tumor of the brain. In another the symptoms were distinctly indicative of arterial thrombosis, yet the patient died of intracranial suppuration. Hitz observed a case in a man twenty-nine years of age who had suffered for sixteen years from otorrhœa, and had, besides, received a blow on the head, both being distinct causes of abscess, yet death occurred from tumor of the brain (*Lancet*, January 12, 1895, p. 82, Murri). One of Professor Murri's cases of abscess of the brain occurred in a man who had never received a blow or any apparent injury to the head, nor had been the subject of suppuration in distant portions of the body, nor had he suffered from any disease that is likely to cause cerebral abscess, yet death occurred, and the autopsy revealed intracranial suppuration. In another one of his cases there had been suppuration in the tissues which surround the bones of the cranium, suggesting that the organic brain disease was due to suppuration, yet the patient died from sarcoma and encephalic tuberculosis. And again, in another one, the symptoms and apparent etiology pointed to tubercular meningitis, but the patient succumbed to intracranial suppuration.

In the diagnosis of chronic abscess of the brain the morbid processes from which the suppuration must be differentiated are tubercular meningitis, softening, hemorrhage, and tumor.

Tubercular Meningitis.—Theoretically it does not seem that there should be much danger of mistaking a cerebral abscess for meningitis; but theory fails, and preconceived opinions of the value of symptoms weaken in the stern reality of clinical facts and post-mortem results, not always because the theory is wrong or the opinions have been based on false premises. There is no portion of the human organism the destruction or irritation of whose tissues gives rise to so clear, invariable, and definite symptoms as that of certain portions of the brain when the lesion is limited and uncomplicated. Irritation of a given portion of the brain will be attended by the same symptoms, no matter how often the irritant is applied, provided the conditions and modifying circumstances are always the same; but the extent of pathological lesions varies, and the degree of irritation or the amount of loss of function from a similar lesion depends upon so many inscrutable causes, that no two cases will be attended by precisely the same symptoms. Besides, the results of irritation of a portion of the brain, whether it be due to meningitis, softening, hemorrhage, or tumor, may give rise to the same general character of symptoms that occur from the presence of an abscess. The majority of cases of tubercular meningitis, even in the adult, run their course in a few weeks, are

attended by a febrile process, and present symptoms of cranial-nerve involvement. While these are the usual symptoms that serve to distinguish tubercular meningitis from chronic abscess of the brain, unfortunately for the diagnostician they often vary greatly. The duration of some cases of tubercular meningitis is longer than that of some cases of chronic cerebral abscess. I reported a case of tubercular meningitis, with continuous symptoms, in a child, to the College of Physicians of Philadelphia, in 1883, in which the disease extended over a period of more than eight months. In the same paper are collected numerous cases, in some of which the duration of the symptoms was a year or more from the time of the first evidence of tubercular disease of the brain to the death of patient (see *Transactions* for 1883). Professor Murri, in the *Lancet* of January 26, 1895, p. 206, reports a case in a man thirty-three years of age, who had suffered horribly from headache for a period of five months immediately preceding his death from tubercular meningitis. In this connection he says: "Kratmer refers to a case which lasted four months, and speaks of those of Leitz of forty-two and fifty-four days' duration; Gatti of Milan, observed one lasting seventy-nine days; and Dickinson noted one of eight months' duration." Rise of temperature is not always found in fatal tuberculosis of the cerebral membranes. It seems to me that we must make a distinction between tubercular meningitis and tuberculosis of the membranes unattended by inflammation. Two years ago I saw and studied with Dr. McLauthlin a case of tuberculosis of the meninges in a man about thirty years of age. He had been suffering from tuberculosis of the lungs for a number of years, and for several weeks before I saw him he had been depressed in spirits and experienced severe headache, but he had not been attended by any physician. During the week immediately preceding his death, covering the time during which he was seen by Dr. McLauthlin and myself, the temperature was slightly subnormal until a day or two before his death, when it registered from 97° to 100° F. At the autopsy the pia at the base of the brain, especially in the Sylvian fissures and over the optic chiasm, was studded with masses of tubercles, but the microscope showed no evidence of recent inflammation. In Murri's case, above referred to, and those of others in which inflammatory products were quite abundant, although probably not of recent date, the temperature was normal or subnormal for a period preceding death. Cranial-nerve symptoms are not invariable in basilar meningitis, and some cases of abscess of the brain are attended by irritation of the cranial nerves.

A condensed report of one of Professor Murri's cases (*Lancet*, January 26, 1895, p. 207) will illustrate this point:

A male, aged thirty-five years, was admitted to the clinic, August 16, 1890. He was in a state of delirium and some stupor. His wife stated that up to his present illness he had never suffered from illness. About

two weeks before this, or in the beginning of August, he began to complain of headache, which became so intense that he could not leave his bed after August 7th. His strength gradually failed; his mental condition from the beginning was abnormally irritable, and soon became dull. On the night of the 15th, a few hours before admission to the clinic, delirium and stupor first appeared. The patient seemed well nourished. Occasionally there would be muscular twitching, when he would give vent to cries of pain in his head. There was slight rise of temperature. Examination on admission to the clinic: Pupils were equal in size; reacted slowly; tongue deviated toward the left; sensory phenomena everywhere dull; spasms and contractions occurred in all the limbs; pulse was 86; respiration 20; temperature does not seem to have been registered; stupor was variable and spasms continued during sleep. Six days later the left pupil was dilated. On the next day, or the 23d of August, the muscles of the back of the neck were rigid and the head retracted; there were ptosis of the right eye and deviation of the eyes and head to the right; reflexes were normal everywhere; general sensory phenomena continued obtuse; smell was absent. On the 25th there was convergent strabismus of the left eye from weakness of the external rectus muscle, and the ball of this eye was painful; the muscles of the left side of the face were weak, and he was unable to protrude the tongue. On the 27th the left leg and arm showed evidence of weakness, but muscular and posture senses were everywhere good; the pulse was regular; there was nystagmus of the left eye, and tonic spasm of the right arm with flexion of the forearm upon the arm and of the hand upon the forearm; reflexes of cornea and pupil of the left eye weak and slow; the right eye presented normal reflexes; deglutition occurred with difficulty, owing to lessened reflex action of the pharynx; the headache continued intense; stupor deepened each day, and by September 12th the patient was absolutely comatose. The pulse at that time varied from 120 to 130, and breathing increased from 24 to 28, and the temperature reached and went above 100.2° F. on several occasions. He was almost always feverish, with the exception of two periods, from August 25th to 29th, and from September 3d to 11th, during which times the temperature remained at 96.6° F. Death occurred on the 14th of September. At the autopsy all the meninges presented a normal appearance. There were three abscesses; one pinhead in size, on the anterior right side of the pons in the vicinity of the nucleus of the sixth nerve; another, small, in the anterior part of the left temporo-sphenoidal lobe; a third and largest, occupied part of the right optic thalamus, internal capsule, and lenticular nucleus; the lateral ventricle was not broken into. The abscess was rather large and completely encapsulated, and contained inodorous, greenish pus. The parts around the large abscess, including the cranial nerves, were greatly compressed.

This case presented the typical cranial-nerve symptoms so commonly witnessed in tubercular meningitis, and as no cause could be found that would have made one suspect intracranial suppuration, the diagnosis must have been difficult, if not impossible.

It will be seen that the ease with which tubercular meningitis and chronic abscess of the brain may be mistaken for each other is much

greater than what at first sight would appear. It is less difficult to point out the dangers of mistakes in diagnosis than to lay down rules by which they may be avoided, but the more we are on our guard the less likely will we be to commit unpardonable blunders.

Cerebral Softening and Focal Encephalitis. I am not aware that any one, either in journal articles or text-books, has pointed out the danger of mistaking cerebral softening from thrombosis of a cerebral artery for chronic abscess of the brain. Professor Murri reports a case, in the person of a girl, seventeen years of age, of grave chlorosis with chlorotic thrombosis of the lateral sinus and of the cerebral veins. This distinguished observer had made the diagnosis of "Chronic abscess of the left temporal lobe," and from a careful study of the clinical symptoms it is difficult to see how this mistake could be prevented in a similar case. It was not until recently, when I encountered a case of focal encephalitis, due to thrombosis of an artery, in a young man who presented symptoms which simulated those of abscess, that my attention was called to it. This case is reported at some length in this paper.

About twelve years ago, while practising in Philadelphia, I was engaged in an elaborate series of observations of the temperature of each side of the body in cerebral lesions, and on the surface-temperature of the head and body in health and disease; but the development of pulmonary tuberculosis in my own person compelled me to abandon the work for a number of years. During the past two years I have resumed the study of the comparative temperature on each side of the body in cerebral lesions, and within the past six months, with the kind and intelligent assistance of trained nurses, both in the St. Luke's and Arapahoe County Hospitals, I have made numerous and interesting observations along this line. It is premature as yet to undertake to arrive at definite conclusions, but the following provisional statements may be made: In paralysis from brain-lesions the temperature on the paralyzed side is equal to or greater than on the unaffected side, when the lesion in the brain is an irritative one; but less on the paralyzed side when the brain-lesion is a destructive, non-irritating one. In cases of hemiplegia from cerebral hemorrhage the temperature on the paralyzed side is lower than on the opposite side during the stage of depression immediately following the hemorrhage; but as soon as reaction has become well established the temperature rises on the paralyzed side to a point about half a degree to a degree Fahrenheit higher than it does on the unaffected side, and remains so for a few weeks, or until, from atrophic changes, the paralyzed parts become cooler than the normal side. In case of hemiplegia of thrombotic origin the difference in temperature of the two sides of the body at first is less than occurs from hemorrhage; but if encephalitis results from the arterial occlusion, the temperature on the paralyzed side will equal or exceed that of the normal side for weeks, months, or even years, and probably

as long as the irritation in the brain remains. In one case under my observation at present, the patient having been paralyzed without loss of consciousness two years ago, although great trophic disturbances have become manifest in the paralyzed limbs, yet the temperature on the affected side remains constantly above that of its fellow. In hemiplegia from tumor or abscess of the brain the temperature may be elevated on the paralyzed side from 0.5° to 2° or 3° F. beyond that of the other, the amount of the heightened temperature on the affected side depending upon the degree of irritation in the brain. Theoretically we should expect to find the difference in the temperature of the two sides of the body greater when the paralysis is due to tumor than when it results from abscess, but I have as yet been unable to determine this point. Slight differences in temperature always in favor of the same side of the body, extending over a considerable period, are significant; but greater differences may occur for a short time and denote nothing of importance.

Thrombosis of the cerebral vessels may take place in persons who have been subjected to causes that are known to be capable of giving rise to cerebral abscess. If this occurs in young subjects, and is followed by encephalitis, headache, paralysis of one group of muscles after another, and a temperature on the paralyzed side equal to or greater than on the unaffected side, the lesion may be mistaken for abscess, especially if the patient denies syphilis and presents no positive evidence of it. Under such circumstances it is probable, although I do not wish to make this point too prominent until further observation enables me to speak more positively, that a temperature on the paralyzed side equal to that of the normal side, or elevated only a few tenths of a degree Fahrenheit above it, would be in favor of thrombosis, while a persistent increase of heat on the paralyzed side of one-half to one or more degrees Fahrenheit would be in favor of abscess. Further, the temperature in cases of thrombosis of a cerebral artery is, as a rule, less variable, and is more commonly normal than that of chronic abscess. The mental condition in cases of focal softening from thrombosis, while it is blunted, is more nearly normal when the patient is aroused than in the cases of chronic abscess that have come under my care. There was one observation made in the case of thrombosis reported in this paper that seemed to point strongly against abscess, and I called attention to it in a clinical lecture the day before the operation. When the patient's leg was first paralyzed the paralysis was complete in all the muscles of the leg and hip, but during the next few weeks paralysis began to lessen in the hip-muscles, and before the patient was subjected to an operation he was able to lift the leg from the bed and hold it straight at the knee. From what we know of the effects of abscess on the surrounding structure of the brain, from œdema and softening, which have a tendency to increase rather than to diminish, it seems very improbable that the degree of

paralysis caused by an abscess will lessen before the pus is evacuated. If optic neuritis, with swelling of the disks, were to occur, a thrombotic lesion might be excluded, although hyperæmia of the papilla, with some slight neuro-retinitis, was evident in the eye opposite to the side of the brain-softening in the case reported in this paper. No choking of the disk was observed.

CEREBRAL HEMORRHAGE. It seems useless to discuss the differential diagnosis between abscess and hemorrhage of the brain The condition presented by the case observed by me of hemorrhage into both anterior lobes of the brain, with gradual filling of the ventricles without paralysis, convulsions, or change of temperature to any extent from the normal, must be exceedingly rare. The case was the more confusing because the hemorrhage followed an illness (la grippe) which has given rise to abscess of the brain.

TUMOR. The diagnosis between chronic abscess of the brain and tumor is sometimes very difficult or even impossible. Professor von Bergmann and many others lay great stress upon etiological considerations and the presence of fever in favor of abscess; but, as we have already seen, the history of middle-ear disease, which Bergmann considers the principal cause of abscess, does not preclude the possibility of tumor.

Hitz, as already mentioned, saw a man who for sixteen years had suffered from otorrhœa, and besides had received a blow on the head, yet he died of tumor of the brain. The case of the little girl, eleven years of age, reported in this paper, illustrates the fallacy of laying too great stress upon etiology. She had suffered from otorrhœa, had had an abscess in the right groin, and had received a severe blow to the head, all possible causes of abscess, yet she died from tumor and cyst of the cerebellum. Instead of the presence of fever being a symptom of chronic abscess, a subnormal temperature extending over a considerable period is more commonly the rule. There may be periods of febrile processes in abscess, but we find also the same condition in tumor. Neither tumor nor chronic abscess free from complication, such as meningitis and distention of the lateral ventricles, is, as a rule, attended by fever. If the temperature-record is any aid in the differential diagnosis between these two morbid processes, it is that a prolonged subnormal temperature, in a case of organic brain-disease, associated with evidences of great prostration, such as loss of flesh, strength, appetite, and, at times, a yellowish-pale hue of the skin, is in favor of abscess rather than tumor. We must remember that while a traumatism to the head is a frequent cause of abscess of the brain, it is also capable of giving rise to tumor. In cases of old injuries to the head, dating back more than a year, in which no evidence of inflammation of the brain immediately followed the trauma, the development of organic disease of the brain, supposing the diagnosis to lie between abscess and tumor, the probabilities, other things being equal,

will be in favor of the latter. Well-pronounced swelling of the optic disks, amounting to $\frac{1}{30}$ to $\frac{1}{20}$ of an inch (requiring +3 D to 4 D to see the centre of the disk) is always against abscess and in favor of tumor. It is conceivable that an extreme degree of choked disk might occur from abscess, but I have never observed it, and I am not aware that it has been met with by others. Complete blindness is not an infrequent result of tumor, and well-advanced amaurosis is very common. In abscess I have never met with marked amaurosis, and my personal experience in this direction is but confirming the observations of Gowers, Murri, and others. Optic neuritis, limited to the same side of the brain as the abscess, is said to have occurred. It must be exceedingly rare, and as the same eye-phenomenon has been observed in tumor, it has no practical diagnostic value. In a case of distention of the right lateral ventricle from accumulation of a straw-colored watery fluid, observed by me some years ago, well-pronounced optic neuritis was found on the right side, while on the left the eye was normal. Hirt calls attention to the diagnostic value of paralysis of groups of muscles consecutively involved in abscess. This undoubtedly is of frequent occurrence in this disease, but, as paralytic symptoms are found in only about one-half the cases of abscess of the brain, and as the muscular involvement from tumor of the brain sometimes takes place by groups, the phenomenon loses much of its supposed significance in a differential diagnosis. A steady but gradual increase of symptoms of organic disease of the brain, with the development of one nerve-root symptom after another, is in favor of tumor, so are prolonged periods during which the symptoms make but little progress.

The only conclusion at which one can arrive after a study of all the symptoms of chronic abscess of the brain, is that the diagnosis is often a most difficult one, and sometimes is an object of impossible attainment. The nearest approach to accuracy in diagnosis in obscure cases is to arrive at a conclusion which amounts to a problematic diagnosis between two or more morbid processes. To recommend an operation for the relief of chronic abscess of the brain only in those cases in which the diagnosis is certain, is to sacrifice many lives that might otherwise be saved by judicious boldness. The physician who has not the courage to recommend an exploratory operation in a strongly probable case of abscess of the brain, lest he may be wrong in his diagnosis, is more solicitous for his own reputation than for the welfare of his patient.

In conclusion, if we are ever to reach positiveness and certainty in the diagnosis of obscure brain-diseases, it will be attained only by a careful study of minute symptoms and what often seems unnecessary and tedious detail.

REVIEWS.

Disorders of the Male Sexual Organs. By Eugene Fuller, M.D. 8vo. pp. 200. New York and Philadelphia: Lea Bros. & Co, 1895.

In his preface Fuller states that, in his opinion, "Trouble located in the sexual apparatus, and primarily, at least, largely independent of nervous conditions, is the chief cause of sexual disturbance in the male." This opinion he demonstrates in his book.

The first part of the work is devoted to anatomical considerations. The text is elucidated by a number of original illustrations taken from photographs. Under the general heading of Physiology the functions of the seminal vesicles are particularly considered. It is held that these are: 'First, to aid in attracting the testicular secretion to the seminal vesicles; secondly, to store it there temporarily and to provide means to preserve its vitality during that period; and, thirdly, to expel the seminal fluid as occasion may require."

The Pathology of Seminal Vesiculitis receives careful consideration. The clinical characteristics are discussed at length. The main feature dwelt upon in treatment is stripping of the vesicles. This is thus carried out: "To accomplish the treatment, the patient presenting himself with a full bladder should, while standing with his knees straight, bend the body forward at right angles. Then the operator should introduce the forefinger of one hand well into the rectum, the fist of the other hand exercising firm counter-pressure over the pubes. By these means the end of the forefinger will in all ordinary cases reach well beyond the posterior margin of the prostate. The bodies of the vesicles can thus be detected, one on each side beyond the posterior prostatic border. (Only the lower half of the body of the vesicle can be felt ordinarily by the finger, the rest being beyond reach.) After the forefinger has been so introduced, firm pressure should be made by its tip on the body of the vesicle to be treated as far back as it is possible to reach. Then the finger-tip, the pressure being maintained, should be slowly and firmly drawn forward along the line of the vesicle. The manœuvre is aided by the counter-pressure over the pubes with the free hand. This process may be repeated several times in connection with each vesicle. In this manner some of the vesicular contents, provided the sac be diseased and distended, can be pressed out along its ejaculatory duct and into the prostatic sinus.

"As has been stated, the stripping should be done on a full bladder, and after the manipulation the urine should be voided in order that the surgeon may see how much has been expressed. This treatment should be repeated not oftener than once in four days, and in most cases under active treatment as often as once a week. If it is done too frequently, or too severe pressure with the forefinger is employed, acute symptoms

may be stirred up which may leave the patient worse off apparently than before treatment was commenced, besides at times causing an acute epididymitis."

The book closes with a number of very striking illustrative cases. This work of Fuller has rendered a real service in that it holds out promise of successfully treating a class of cases which have heretofore been peculiarly rebellious to every proposed application of therapeutics.

E. M.

THE NATIONAL FORMULARY. Supplement to the NATIONAL DISPENSATORY. New and Revised Edition. Pp. 115. Philadelphia and New York: Lea Brothers & Co., 1896.

THIS edition shows an increase in size when compared with its predecessor, and presents the formulas of four hundred and fifty-four preparations. Although these are unofficial preparations in the sense that they are non-pharmacopœial, yet so many are in daily use that this work as a guide for the careful physician is second only in importance to the *Pharmacopœia*. As a collection of working formulas for the pharmacist, and as an authoritative mentor to the physician who wishes to increase his therapeutic resources beyond those strictly official, we welcome the convenient form and useful contents of this work which is a fitting supplement to the *National Dispensatory*. Many preparations which are now used under their proprietary names should be replaced by those to be found in this book, whose composition is given and whose construction is based upon scientific principles. We earnestly recommend its careful study and daily use to the end that better and more professional prescribing may result.

R. W. W.

LE HOANG-NAN, REMÈDE TONKINOIS CONTRE LA RAGE, LA LÈPRE ET AUTRES MALADIES. Par E. C. LESSERTEUR, Directeur au Séminaire des Missions Ètrangères. Pp. 235. Paris: J. P. Ballière et Fils, 1896.

HOANG-NAN, A REMEDY FOR HYDROPHOBIA, LEPROSY, AND OTHER DISEASES. By E. C. LESSERTEUR.

WE read with interest this collection of reports, testimonials, and opinions collected from various sources, and presented in good faith and thorough belief in the virtues of the drug. This remedy from Tonquin contains as its active principles strychnine and especially brucine. It is used in the form of pills, each weighing five grains, of which the following is the formula: Alum, 1; natural realgar (which contains less arsenic than the artificial), 1; powdered bark of hoang-nan, 2 parts. The amount of arsenic may be doubled, or the powdered bark may be used alone. For hydrophobia, or the bite of snakes, three such pills dissolved in vinegar should be given, and the amount gradually increased until the physiological symptoms of brucine are seen. It is also claimed that hoang-nan is a preventive. During treatment alcohol in every form as well as stimulating foods are proscribed. For leprosy the pills

may be used with or without vinegar. The treatment is commenced by giving one-half of a pill morning and night, the next day one pill at the same times, and increasing one pill each day until five or six are taken at a dose. They are now omitted for twelve days, then the same plan is repeated, care being taken that the treatment shall not be continued for more than seven or eight consecutive days, especially if the patient is not very robust. The drug is also recommended for scrofula, ulcers, and paralysis. The author concludes that in small doses it is a mild cerebro-spinal stimulant, improves nutrition, and is a general tonic. In larger doses it is an energetic nervous excitant, and, like other bitters, it destroys lower parasitic organisms and micro-organisms. We are disposed to agree with the author that the remedy has been of undoubted benefit in the cases cited, and the reasonable explanation is to be found in its chemical composition which is given above. R. W. W.

THE TREATMENT OF PHTHISIS. By ARTHUR RANSOME, M.D. (Cantab.), F.R.S., Consulting Physician to the Manchester Hospital for Consumption and Diseases of the Chest and Throat; Examiner in Sanitary Science at Cambridge and Victoria Universities. Pp. xiii., 237. London: Smith, Elder & Co., 1896.

THE reader who expects to find anything new or startling in this book on the treatment of pulmonary tuberculosis will be disappointed. But he must indeed be a dull physician who cannot glean from its pages many valuable suggestions and learn much that will be of undoubted benefit to his patients. The fact that this work is written from the experience of a single observer, modified somewhat by that of his associates and a fairly extensive acquaintance with British and French literature, precludes authoritative statements upon the use of the various anti-tubercle serums and of recent modifications of older methods, as, for instance, creosote carbonate in place of creosote. Perhaps this very point adds to the value of the book, because in this way the ordinarily accepted methods have received more attention. We would especially commend the carefully studied conclusions in regard to the communicability of the disease, which are in such marked contrast to the hysterical emanations from boards of health. The results of these are simply to alarm the unthinking rather than to indicate, as they do, to the initiated, that an argument for their existence is, of necessity, occasionally promulgated. The climatic treatment is fairly treated, and one following the advice therein contained is not likely to aid in filling the cemeteries of the various health-resorts, nor add to the misfortunes of those whose lives are already a miserable existence. The healthy optimism of the author makes his work helpful and not condemnatory. We are disposed, with increasing experience, to believe that the outlook is even more hopeful. With the exception of a few mannerisms and the occasional use of "tubercular" for "tuberculous" the book is, from a literary point of view, excellent. We commend this volume as the outcome of careful practical work by a discriminating and patient observer, and we predict for it a cordial reception. R. W. W.

THE INTERNATIONAL ENCYCLOPÆDIA OF SURGERY. Edited by JOHN ASHHURST, JR., M.D., LL.D. Supplementary volume. New York: William Wood & Co., 1895.

THIS volume is intended to bring the surgical subjects treated of up-to-date. This object has been accomplished. Some of the chapters are more interesting and instructive than others. A few of the more important subjects are noticed here.

Inflammation, by Harold C. Ernst, M.D., in thirty pages is made a *rêsumé* of the recent advances in the knowledge of inflammation. Immunity and phagocytosis are discussed. Chemotaxis and bacterial infection of the leucocytes are presented. Chemotactic and phagocytic poison do not explain all the phenomena seen in inflammation, but they surely form an important part in such explanation.

Wounds and Wound-treatment, by Fred. Kammerer, M.D. The fact is emphasized that immediate wound-healing is not the generally recognized method of healing, but that all wounds unite by granulative tissue. Under the modern treatment of wounds the author thinks that the methods are more complicated than of old. What can be simpler than heat to sterilize everything with, excepting hands? He says there is no reason why we should any longer to-day uphold the doctrine that clean wounds are to be treated aseptically and infected wounds antiseptically. There should be no difference in the treatment.

Diseases Complicating Wounds are described by Otto G. Kiliani, M.D.

The article on Tumors, by B. F. Curtis, M.D., is extremely well presented. The terratomata are first considered; secondly, the neoplasms of the connective-tissue group; and, thirdly, using the endotheliomata as a transition-form; there is an admirable description of epithelial tumors.

Injuries and Diseases of Nerves, by John B. Deaver, M.D. Operations upon nerves are not studied with special reference to the end-results, which are of the greatest importance.

Injuries and Diseases of the Neck, by Joseph Ransohoff, M.D. This chapter is admirably classified and well written.

Diseases of the Breast, by Dr. M. H. Richardson, affords a clear summary for the guidance of the operating-surgeon.

Diseases and Injuries of the Bursæ by Charles B. Nancrede, M.D. Greater operative freedom is allowed in the care of the diseases of the bursæ than a few years ago was thought justifiable. In bunion the removal of the bursal sac is advised and all exostoses removed and the head of the metatarsal bone is chiselled down until smooth.

Diseases of the Joints are described by Robert W. Lovett, M.D. Tuberculosis of bones and joints is classed among the questions to a large extent settled. The presence of tubercle bacilli in the affected structures, the inoculation-experiments, the generalization of tuberculosis, the presence in the tissues of tubercle-structures, all point to the identity of the so-called strumous, scrofulous, and fungous diseases, they all being tuberculous. The local treatment of tuberculous joint-disease by tuberculin is discussed and the treatment by the injection into the diseased tissues of some remedy is described. The separate *rêsumês* are extremely interesting, and, after studying them, one feels repaid and that his knowledge is up-to-date. Dr. Lovett has made very fair deductions from

the evidence he presents. The section on Hip-disease is extremely well chosen.

Venereal Diseases: Gonorrhœa, by J. William White, M.D. The specificity of gonorrhœa is pathologically and experimentally proved, almost without doubt. The compressor urethræ muscle is thought to be assisted in preventing the development of a urethritis in the posterior urethra by the diminished vascularity of this portion of the canal. The results of antiseptic treatment are not so uniformly successful as might be expected. No one antiseptic agent can be depended on.

The Simple Venereal Ulcer—Chancroid, by F. R. Sturgis, M.D. The history of the work done since 1889 by various investigators upon the inoculability of the chancroid is stated and the conclusion is drawn that although there is little doubt that a peculiar microbe has been found in the secretion and in the tissues of the chancroid, it is yet too soon to determine its importance as regards the question of inoculation. Are the buboes which follow or accompany chancroids virulent by absorption or virulent by subsequent inoculation? The evidence seems to point to the bubo as inflammatory at the beginning and the virulence as secondary in the large majority of all cases; occasionally, however, there will occur a virulent absorption. In treatment of chancroid nothing new of importance has been presented.

Venereal Diseases: Syphilis, by Arthur Van Harlingen, M.D. He considers syphilis of the circulatory system, and in the general treatment of syphilis describes the hypodermatic method, choosing the prescription: Hydrarg. chlor. corrosiv., gr. viij, sodii chlorid., gr. xv, and aquæ destil., ʒiij, as being least irritating and most soluble. Fifteen minims of this solution represent about one-twelfth of a grain of the bichloride of mercury.

Surgical Diseases of the Skin, by J. Abbott Cantrell, M.D. Minor additions to the original article have been made. Psorospermosis has been dealt with at some length.

Diseases of the Cellular Tissue, by Samuel Ashhurst, M.D. He favors the view that the cellular tissue of the body contains the starting-points of the lymphatics in its interspaces, though this view has not yet been proved. The cellular tissue is, therefore, more than framework of the body, it is an organ of high value, having functions of a high order.

Injuries of Bloodvessels and Aneurism, by Louis McLane Tiffany, M.D. Emphasis is laid on the simple closure of the lumen of the vessel without rupture of the inner and middle coats in ligature. Aneurismal sacs are to be dissected out when possible and removed entire, ligating distally and proximally the vessel.

Surgical Diseases of the Vascular System, by John A. Wyeth, M.D. The pathology of phlebitis receives careful attention. The method of healing after ligature of arteries is discussed, and the weight of the microscopical evidence seems to point to the fact that any histological element capable of proliferation may take an active part in the organization of a blood-clot. Warren has demonstrated that the muscle-elements take part in the organization of the thrombus.

Injuries and Surgical Diseases of Lymphatics, by Charles B. Nancrede, A.M., M.D.

Injuries of Bones, by John H. Packard, M.D. A very complete *résumé* is given of the most recent cases and the changes in treatment of fractures to date.

Diseases of the Bones, by Charles W. Dulles, M.D. A classification

based on the etiology of diseases of the bones is made: (*a*) Disorders of development. (*b*) Disorders of nutrition. (*c*) Disorders of physiological processes. Osteomyelitis is described in much detail.

Injuries of Joints, by Edmund Andrews, M.D.

Excision and Resection, by John Ashhurst, Jr., M.D. Dr. Ashhurst makes a report of his own personal experience in excision of the various joints. He certainly has had exceptional opportunities in this field of surgery, and the article is doubly interesting because of its fresh and vigorous style and because one feels that it is an expression of personal opinion and not a mere collection of facts.

Orthopædic Surgery, by De Forest Willard, M.D., who in a very brief way speaks of foot-deformities and their most modern treatment, and describes a few of the orthopædic affections.

Surgical Diseases of the Head, by Dr. W. W. Keen. This chapter sets forth in a clear, concise, and accurate manner the whole subject of cerebral surgery. I can find nowhere so splendid a statement of the present position of cerebral surgery as here.

De Forest Willard, M.D., writes the article upon Diseases of the Spine. This is a valuable article because it is written from the point of view of the orthopædic surgeon.

Diseases of the Eye and Diseases of the Ear and Nose are presented by C. W. Kollock, A. H. Buck, and R. W Seiss, respectively.

Injuries and Diseases of the Face, Cheeks, and Lips, by John B. Roberts, M.D.

Hernia, by John A. Wyeth, M.D. A statement of the author's treatment of hernia is given. This is no exhaustive study of hernia.

Anæsthetics and Anæsthesia, by Albert I. Bouffleur, M.D. The author states that the evidence points to the use of ether first for surgical anæsthesia by Long, of Georgia. The *honor* of the demonstration to the world of the use of ether in surgery will always be associated with the names of Morton and Jackson, of Boston, who demonstrated its use at the Massachusetts General Hospital in 1846. That an obscure man like Long first used it counts for little. The man who gives his discovery to the world is the great man and deserves the honor of the discovery. The general directions for the use of ether are well chosen.

Construction and Organization of Hospitals, by Edward Cowles, M.D. This is a brief description of several hospitals, illustrating their construction in general and their management in particular.

Injuries and Diseases of the Female Genitals, by Theophilus Parvin, M.D., LL.D. Operations for the restoration of the perineum and for colporrhaphia are described. Tait's, Winckel's, Martin's, and Sänger's operations for ruptured perineum are described. C. L. S.

CONTRIBUTION A L'ÉTUDE DE L'ATROPHIE MUSCULAIRE PROGRESSIVE TYPE DUCHENNE-ARAN. Par le DR. J.-B. CHARCOT, Ancien interne des Hôpitaux. Paris: Bureaux du Progrès Médical, 1895.

PROGRESSIVE MUSCULAR ATROPHY OF THE DUCHENNE-ARAN JYPE.

THE present work is, as the author modestly states, not a monograph, but merely an attempt to show that the form of muscular atrophy known

as that of Aran-Duchenne has a distinct anatomical and clinical existence. Dedicated to the memory of the author's illustrious father, this is a clinical and anatomical study in the best manner of the French school. It is all the more interesting because it is especially in France that the analysis of muscular and spinal paralyses has gone so far that in some recent works one looks in vain for an account of the disease under consideration. This is notably so of the recent *Traité de Médecine* published under the direction of Charcot and Bouchard, in which Marie gives his reasons for erasing the name of progressive muscular atrophy from the nosology. Dr. Charcot in the present work brings proofs of the existence of that disease and its absolute distinction from amyotrophic lateral sclerosis. As to the pathogenesis of the disease he says nothing, at all events he "finds no proof that it depends on an infection or an intoxication." The difficulty of demonstrating the existence of Aran-Duchenne's paralysis, the author thinks, depends largely on the fact that it is not only rare, being less frequently observed than amyotrophic lateral sclerosis and syringomyelia, but that it is essentially chronic, frequently lasting more than ten years, so that the autopsies are rarely possible. The investigations of the author lead him to conclude a close relationship between subacute poliomyelitis and the form of Aran-Duchenne, such as exists between acute and chronic pulmonary tuberculosis. As proofs the author presents a number of careful clinical histories and one autopsy of the chronic form, and the history and histological investigation in a case of subacute anterior poliomyelitis. In these cases there were degenerations occupying the anterior root-zone. This zone is similiar in the two cases, though more clearly defined in the chronic case. Varying in shape in different regions, it seems proportional to the atrophy of the ganglion-cells of the anterior horns. The degeneration extends from the second cervical to the first sacral nerve. The adjacent anterior columns are intact, but in the posterior columns those of Goll are slightly sclerotic in the cervical region.

The relations of these alterations to the clinical features of the disease are discussed in the light of the most recent additions to the knowledge of spinal-cord anatomy. A number of other cases bearing on the question are cited, and the classic article of Strümpell quoted *in extenso* in an appendix. The work is illustrated by colored plates showing the topographic relations of the lesions. It forms an important addition to the literature of the spinal paralyses. G D.

DIE ERKRANKUNGEN DES RÜCKENMARKES UND MEDULLA OBLONGATA. Von Geh. Med.-Rath, Prof. Dr. E. LEYDEN und Prof. Dr. GOLDSCHEIDER. 1. Allgemeiner Theil. Wien: Alfred Holder, 1895.

THE DISEASES OF THE SPINAL CORD AND MEDULLA. By Professors LEYDEN and GOLDSCHEIDER. General Part.

THIS volume is one of the new systems published under the direction of Professor Nothnagel. The whole work, the lineal successor of the similar systems of Virchow and Ziemssen, which appeared respectively about four and two decades ago, is to be complete in twenty-two volumes, and to include all of internal medicine, with diseases of the urinary and genital apparatus and some diseases of the eye. The names of the

numerous authors are well known in medical literature, and the assignment of topics, as usual in such works, in some cases seems somewhat peculiar. However, the most important chapters are in the hands of experts, as evidenced by the fact that Kartulis is to write on Dysentery, Naunyn on Diabetes, Ehrlich on Diseases of the Blood, Litten on the Hæmopoietic Apparatus, Leyden on the Heart, and Senator on the Kidneys.

Diseases of the Nervous System are to be treated in four volumes, under the immediate charge of Leyden, Bernhardt, Möbius, Binswanger, Oppenheim, Lichtheim, Goldscheider, and others.

The present fasciculus of 212 pages forms about one-third of Volume X., the rest of the volume being devoted to special diseases of the spinal cord and medulla and to polyneuritis.

The fascicle begins with a description of the anatomy of the spinal cord and medulla. The gross and microscopic anatomy and the finer histological details are described in the light of the more recent researches. A succinct account is given of the neuron as the basis of spinal anatomy and physiology. In connection with the description of the posterior columns a brief historical note is added on the development of our knowledge of that important part.

The physiology of the cord is presented necessarily in brief form, yet with sufficient fulness for the purpose of the work. The trophic functions receive considerable attention.

The chapter on the General Pathological Anatomy of the Cord begins with a description of methods of examination. This is evidently intended to render clear future references to technical matters rather than to furnish information for beginners. The subsequent sections, on the various changes in diseases of the cord, would have gained much by appropriate illustration. In this chapter the neuron as the foundation of special pathology is particularly considered, and its relation to the older conceptions of system and combined-system disease explained. The importance of vascular changes, syphilitic and other, in causing disease of the cord is briefly stated.

The longest chapter is that on Symptomatology. In it all the varied symptoms, direct and indirect, of spinal-cord diseases are adequately treated. The localization of spinal disease is considered in an appendix to this chapter.

The chapter on Etiology is disappointing from its brevity. Perhaps this subject will be treated more fully in connection with special diseases.

The last chapter on General Therapeutics is brief but of great interest. Drugs, hydro- and balneo-therapeutics, mechano-therapy, operative and orthopædic surgery, and electro-therapeutics are discussed. A specific or even curative action of electricity on the diseased cord is denied, though the possibility of improving morbid conditions in peripheral nerves is admitted. The relation of suggestion to electro-therapeutics is not unfairly stated, the psychic effect, according to the authors, being much more complicated than that ordinarily understood by the word suggestion.

On the whole, the volume well fulfils its object as a reliable and brief guide to the physician who reads German. Even specialists will no doubt find it useful for reference, especially if the complete volume is provided with an adequate index. To specialists, also, references would no doubt be welcome. The press-work and paper are excellent. The work as a whole, if completed on the high grade of this volume, will be a worthy successor of its forerunners. G. D.

A Pictorial Atlas of Skin Diseases and Syphilitic Affections. In Photo-lithochromes from Models in the Museum of the St. Louis Hospital, Paris. With explanatory woodcuts and text. By E. Besnier, A. Fournier, Tenneson, Hallopeau, DuCastel, H. Feulard, and L. Jaquet. English edition edited and annotated by J. J. Pringle, M.B., F.R.C.P. Part III. London: The Rebman Publishing Company, Ltd. Philadelphia: W. B. Saunders, 1896.

This—the third section of this *Atlas*—deserves the same favorable commendation as the preceding parts. The artistic standard is fully as high, and the selection of cases judicious. The diseases represented are syphilis of the tongue, dermatitis herpetiformis, syphilitic gummata, and epitheliomata of the face. The first plate (Fournier) pictures the several principal types of tongue-ulceration occurring in the advanced stage of syphilis, such as "sclerosing" glossitis and gummatous glossitis. The two forms of sclerosing glossitis are shown, the superficial or cortical, and the deep or parenchymatous. Of gummatous glossitis are exhibited the superficial or mucous form, and the deep or submucous or muscular. These cases are also further elucidated by analytical woodcuts. In the case of dermatitis herpetiformis depicted in the second plate (Hallopeau), the eruption is mostly of the type that is seen in erythema and herpes iris. A woodcut of this is also added. The third plate (Fournier) portrays syphilitic gummata of the thigh. This is an admirable presentation of this phase of syphilis, as is also that plate showing syphilis of the tongue, already referred to. These two plates are valuable additions to our pictorial representations of syphilis. The fourth plate (Besnier) shows a case of "disseminated epithelioma of the face of sebaceous origin." Slight and milder degrees of this condition are not at all infrequent in the practice of those of large experience. While the disease as here presented is much more extensive than usually noted, yet its characteristics are well shown, and the plate has, therefore, a distinct clinical value. This case is also further illustrated by a woodcut. A valuable feature of this publication is the clear and terse character of the accompanying text. Dr. Pringle's English is most readable and his translation from the French most satisfactory. H. W S.

An Atlas of Ophthalmology, with an Introduction to the Use of the Ophthalmoscope. By Dr. O. Haab, Professor of Ophthalmology, University of Zurich. Translated and Edited by Ernest Clarke M.D., B.S. (Lond.). New York: William Wood & Co, 1895.

Dr. Clarke has performed a useful service in translating and editing Dr. Haab's *Atlas*, which consists of series of colored plates representing the normal and abnormal appearances of the fundus oculi. We have had occasion to use this *Atlas* not a little in teaching, and can testify to its value, although we believe, in spite of the author's assertion to the contrary, that it would have been better if the drawings had been made entirely by the direct method of examination. As it is, the indirect method has been employed, but the details have been supplied by the direct method. G. de S.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

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The Duration of Vaccinal Immunity Conferred by Variola.

Dr. J. J. Matignon has studied this question in the north of China. One hundred and twenty-two children were vaccinated by scarification or pricking; of these, seventy-three were successfully and two doubtfully vaccinated. The average age of the children was five and eleven-hundredths years; the average age at which they had been attacked by variola, three and eight-tenths years. From these observations he concludes that in this country variola confers only a temporary immunity against vaccination; its duration varies from seven to nine and three-tenths years. The success of the vaccination is in proportion to the age of the child, because children here are usually attacked by variola at an early age. Success in these vaccinations is in proportion to the quantity of vaccine inoculated. Vaccination by scarification presents no real advantages over that by pricking. On the contrary, the former is more frequently followed by adenitis, because the pustules are larger and more numerous and give greater opportunity for excavation than in the latter. In these cases the pustules were true vaccinal, because their serum was successfully inoculated in newly born children. There is no relation between the severity of an antecedent variola, judged by the cicatrices found on the face, and the vaccinal receptivity. Finally, it is necessary for Europeans living in Pekin, where the disease is endemic, who have undergone variola, to be revaccinated after a certain time.—*Bulletin Général Thérapeutique*, 1896, 7e liv. p. 314.

The Treatment of Atrophic Cirrhosis by Hepatotherapy.

Dr. Vidal has made use of the pulp of pig's liver in daily dosage of three or more ounces in three instances. The liver is obtained from an animal freshly killed, and the pulp is scraped with a knife. One and one-half ounces are given at the commencement of each meal in Laborde's *potage au tapioca*

médicinal, which is admirably tolerated by most patients. This treatment acts by temporarily supplying the functions which have ceased or by producing a diuresis through the renal filter. In the cases reported diuresis was marked.—*Les Nouveaux Remèdes*, 1896, No. 8, p. 229.

THE TREATMENT OF TYPHOID FEVER WITH TYPHOID THYMUS EXTRACT.

DR. GEORGE B. HENSHAW reports thirteen instances of its use, in eight of which the results have been as satisfactory as could be expected. In four the course of the disease has not been materially shortened, and one death from hemorrhage occurred. The injections have not been in any way injurious to the welfare of the patients, and the extract seems to be worthy of a further trial. He would suggest the use of a stronger and more concentrated extract and earlier and more persistent injections.—*Boston Medical and Surgical Journal*, 1896, vol. cxxxiv. p. 477.

SUPRARENAL EXTRACT IN ADDISON'S DISEASE.

MR. L. A. FRANCIS reports a single instance of the use of five grains of the dried gland as a tablet, three to six times daily. During ten weeks' treatment there was considerable improvement; then the patient remained well for five weeks. At this time he began to lose appetite and again got weak and thin, and finally died about two weeks later.—*British Medical Journal*, 1896, No. 1844, p. 1088.

LYSSA HUMANA

DR. RICHARD PALTAUF reports upon the use of antirabic inoculation in eighty-one persons, divided into three classes: The madness of the animal determined experimentally or by the development of madness in animals or men bitten at the same time, thirty-six cases; the madness of the animal determined by veterinary examination, thirty-eight cases; in the remainder the madness of the animal was highly probable. So far as known, lyssa has not developed in any of these instances during the year which has elapsed since the record has been finished.—*Wiener klinische Wochenschrift*, 1896, No. 16, S. 285.

FATAL POISONING BY OYSTERS.

DR. ANTON BROSCH reports a very carefully observed instance. The important findings were hemorrhages of the size of a pin-head in the cerebellum, œdema of the spinal pia, and hemorrhages in the gray matter, especially in the dorsal and lumbar regions, also in the pleuræ and lower portion of the ileum. The cardiac portion of the stomach was ecchymosed and the spleen enlarged. The microscopic examination of the heart and kidneys showed an advanced parenchymatous degeneration of the muscular fibres of the heart and of the renal epithelium. The protoplasm of the liver-cells was filled with large and small fat-balls. The cell-wall and the nuclei were not changed. The hemorrhages were probably due to the manner of the death, and not to the poison itself. Although the chemical examinations

are unsatisfactory, the clinical picture is distinct and should not be mistaken. These cases should be separated into two classes: 1. The bacterial cholerines; and (2) the severe poisonings. In the first, evacuants and disinfectants should be given. In the last, the stomach should be cleaned by the pump and the intestine by high irrigation; frequent evacuations of the bladder by catheterization, artificial alimentation by the stomach-catheter, and artificial respiration if necessary. The poisoning is not of bacterial origin, but is due to a toxic substance, resembling an alkaloid, which is found preformed in the body of the animal. Similar bodies have been isolated from mackerel, as hydrocollidin, parvolin, and æthylendiamin. In other fishes compounds have been found resembling curare in their action. In horse-muscle a like substance, named mytilotoxin, has been detected, which gives rise to salivation and diarrhœa.—*Wiener klinische Wochenschrift*, 1896, No. 13, S. 219.

The Absorption of Iron.

Dr. Justus Gaule, from his carefully conducted laboratory-experiments, formulates the following statements: 1. Not only the organic, but also the inorganic salts, as the chloride, are absorbed. 2. The chloride is absorbed, since, with the organic substances in the stomach, it is changed to an organic substance. 3. Absorption takes place almost exclusively in the duodenum, although in the stomach and small intestine it can be shown to take place. 4. The absorption takes place through the intestinal epithelium and through the central vessels of the cells; also in similar manner as the fats. 5. Two hours after the entrance of the iron preparation into the intestine there can already be shown in the pulp-cells of the spleen an increased deposition of the so-called iron-reserve. 6. The progress of the iron-absorption is completely normal, and does not result from a disturbance of the normal activity. —*Deutsche medicinische Wochenschrift*, 1896, No. 19, S. 289.

The Subcutaneous Injection of Iron Salts in the Treatment of Anæmia.

Dott. Scipione Riva-Rocci presents a very careful study of the literature of the subject. His clinical studies commenced in 1889, making daily use of a 10 per cent. solution of iron and ammonium citrate, one grain and upward of the drug being given in each injection. On account of severe febrile reaction the periods of observation were too short for definite conclusions. Injections of 10 per cent. ethereal solution of ferric chloride proved to be so irritating that he returned to the first-mentioned preparation. The forty cases which are briefly reported show that the method is practicable and yields good results. In every instance in which the injections were continued sufficiently the percentage of hæmoglobin regularly increased, and contemporaneously the phenomena of anæmia, both subjective and objective, decreased. These reports show that the anæmic condition can be markedly benefited by iron when given subcutaneously.—*Il Policlinico*, 1896, No. 8, p. 168.

Dr. J. M. Da Costa has experienced difficulty in finding a stable, non-irri-

tating preparation. The least objectionable is probably ferrous manganese citrate in daily dose of three grains. Full antiseptic precautions must be observed. The crystals are powdered in a mortar and dissolved in hot distilled water, one grain of the drug to five minims of water. Of this, fifteen minims represent three grains of the compound salt. Iron should not be injected indiscriminately, but only when rapid action is needed, as after exhausting hemorrhage or in anæmic persons with delicate digestion, who cannot assimilate iron by the stomach; or in gastric ulcer when it is desirable to prescribe iron, or when iron given by the mouth constipates excessively, or when a decided action on the nervous system is required. It is claimed for iron thus introduced that it remains in the organism as an assimilable substance, producing hyperæmia in various organs and tissues, favoring the absorption of œdema in anæmic patients, the destruction of old red blood-corpuscles, and the formation of new hæmatins. It may act directly upon the whole blood-forming apparatus, and not indirectly, as when introduced by the mouth. Or it may be stored up in the liver, from which it is slowly excreted into the blood.—*Therapeutic Gazette*, 1896, No. 5, p. 289.

The Treatment of Pernicious Anæmia.

Dr. Alfred Stengel considers the specific treatment to consist in the use of these remedies: Iron, arsenic, and bone-marrow. Clinical experience allows no question regarding the value of the first in various anæmic conditions. In certain cases of the pernicious variety good results have been obtained; but in most it is of little value, and it may contribute to the patient's discomfort and unfavorably influence the progress of the disease if it should be administered during its active stage. In convalescence, however, it is valuable, as Blaud's pill, iron albuminoid, or one of the physiological preparations. The latter have no special advantage over some of the inorganic preparations, excepting that they may be more acceptable to the stomach and not so constipating. In many cases arsenic is a specific—in that it has really power to combat the progress of the disease and perhaps to effect a cure. It may in some way prevent intestinal putrefaction, increase the resisting power of the blood-corpuscles, or increase the hæmogenetic function. Ordinarily Fowler's solution, administered by the mouth in from five to twenty-drop doses three times daily, proves to be sufficient. If the dose has reached this limit without noticeable change in the condition of the blood, great care should be exercised in the further increase of dose. If gastro-intestinal disturbances are feared, it may be administered hypodermatically in dose from five to ten drops with an equal part of water. The use of bone-marrow can scarcely be said to rest upon a scientific basis, since the marrow is nowise an organic secreting tissue. Regarding the variability in action in different cases, much may depend upon the method of its preparation. The plain marrow cannot always be administered on account of the objection of the patients. The red marrow from the tibia of the calf, mixed with an equal quantity of glycerin and rubbed up in a mortar, results in a preparation of pleasant taste and one that can be eaten with bread without disturbing the stomach. The preparation may be made more fluid by the addition of claret or port wine. Besides these remedies measures directed to

the improvement of the general circulation and to the prevention of gastro-intestinal fermentation must be adopted.—*Therapeutic Gazette*, 1896, No. 5, p. 293.

The Value of Forced Artificial Respiration in Saving Human Life in Chloroform, Ether, and Nitrous Oxide Narcosis.

Dr. George E. Fell claims that within the past nine years one hundred human lives have been saved by the Fell method, which would certainly have been sacrificed had reliance been placed upon the methods at the command of the profession previous to this period. The success of the method has demonstrated that two accepted opinions are not accurate: (1) That the air-vesicles of the lungs would not resist forcible mechanical measures; and (2) that the epiglottis would not fall and close the glottis in forced respiration. This method is not only useful in opium-narcosis—the reason for its use at first—but in all cases of asphyxia or superficial respiration from any cause in which artificial respiration may be needed it is the most easily applied and the most reliable method known. A single instance of its use in morphine-poisoning, the drug having been administered hypodermatically, is reported with great care. In this instance the method was successfully employed for four days and three nights; the total time of constant use was nearly eighty hours.—*Medical Record*, 1896, No. 1334, p. 760.

The Treatment of Atony of the Small Intestine in Neurasthenics.

Dr. Chalmet, believing that whether the nervous system presiding over the epithelial (secretion and absorption) and muscular functions may or may not play the principal part in this condition, the best method of improving the tone of the nerve is to nourish it better. To improve nutrition he administers during the early hours of intestinal digestion salt-water enemata of a concentration above that of blood-serum—*e. g.*, 0.1 to 1.2 per cent. of salt—in order that he may produce in the large intestine an osmotic current which shall act at a distance upon the small intestine, retarding absorption and permitting the transformation of food-stuffs to go on for a longer period before absorption of the liquid containing these substances in solution.—*Journal des Praticiens*, 1896, No. 18, p. 276.

Potassium Permanganate in the Treatment of Opium-poisoning.

Dr. Arthur P. Luff believes that his experiments demonstrate the selective faculty of this drug for morphine in the stomach-contents, and confirms Moor's conclusion as to its value as an antidote. When the quantity is known the antidote should be given slightly in excess of the morphine. If laudanum in known quantity has been taken, six grains should be given for each fluid-ounce of poison. If the amount of morphine or opium is unknown, eight to ten grains should be administered, according to the severity of the symptoms, dissolved in from four to eight ounces of water. The stomach should be washed out at half-hour intervals with a weak solution of the antidote. In cases of poisoning by the hypodermatic injection of morphine the hypodermatic injection of the antidote would not likely be of use. In cases of

threatened respiratory failure, strychnine, preferably, or atropine should be given hypodermatically, and, if necessary, artificial respiration be resorted to.

Mr. F. P. Maynard states that this is a strictly local antidote, acting only upon such opium as it comes in contact with in the stomach, and can have no effect upon such as has already been absorbed. The treatment is excellent, as leading to a thorough washing out of the stomach and at the same time affording a reliable indication when this has been accomplished. It is not to be expected that it will save life when a lethal quantity has already been absorbed into the circulation, nor can it be regarded as a physiological antidote, as is eserine to atropine.—*British Medical Journal*, 1896, No. 1846, p. 1193.

Chlorosis, with Especial Reference to its Treatment by Intestinal Antiseptics.

Dr. Charles W. Townsend reports thirty cases, which could be carefully followed, treated with beta-naphtol, without iron, for purposes of intestinal antisepsis. Two grains were given three times daily, and the average length of treatment was three and one-third weeks. The average gain in hæmoglobin per week was 1.85 per cent. There were thirty-one cases treated with Blaud's pills, five grains thrice daily for an average of four weeks. The average gain of hæmoglobin was 5.07 per cent. Seven patients who were constipated were treated with cascara alone, but the results were not very encouraging, for the average loss of hæmoglobin was 1.50 per cent. per week in an average of two and one-seventh weeks' treatment. Of the thirty-one cases above mentioned which were treated with iron, twelve had previously received beta-naphtol for three weeks. These, when put on iron, gained 6.7 per cent. per week for an average of four and two-thirds weeks. An additional series of twenty-eight cases were treated by two grains of beta-naphtol and four grains of Blaud's pills thrice daily. The results were considerably better than those obtained by iron alone and much better than those with beta-naphtol alone.—*Boston Medical and Surgical Journal*, 1896, vol. cxxxiv. No. 528.

The Question of Dose in Certain Forms of Nervous Disorders.

Mr Walter Tyrrell wishes to record a practical point in the treatment of those nervous disorders which arise from exhaustion of the nervous system. These conditions may be classified as (1) those in which loss of control and irritable action are the main symptoms; and (2) those marked more by depression and loss of functional power. In both forms good results are to be obtained, provided we can nourish the brain without stimulating it; and, further, the doses must be small and a full allowance of time given. Especially useful are cod-liver oil, the phosphates, and small doses of arsenic or iron. The one drug which is most useful is nux vomica, but the pharmacopœial dose of one-quarter to one grain will, in the large majority of cases, increase the intensity of the symptoms. If, however, we use one-hundredth, or even one-half of this, of a grain and continue it for months, instead of days, the result will be a complete, though gradual, recovery.—*British Medical Journal*, 1896, No. 1843, p. 1031.

The Treatment of Cerebro-spinal Meningitis by Hot Baths.

Dr. Alfred Wolisch reports seven cases, of which five completely recovered. Of the deaths, one was a *foudroyant* case, which died within forty-eight hours, the others in the late stage of the disease, the baths being employed only during the first two weeks. No statement can be definitely made as to the precise action of the baths, although it is probable that the resulting hyperæmia of the skin lessens the amount of blood contained in the brain and spinal cord. It is also likely that in the markedly increased perspiration, the toxin which has accumulated in the blood may be eliminated. These baths in the reported cases seemed to lower the temperature, to have a toning and regulating influence upon the heart, and to relieve pain and restlessness. The method is as follows: The patient is placed in the bath at the temperature of 90.5° to 92.75° F., and hot water gradually added until 104° F. is reached. While in the bath an ice-bag or a Leiter cold-water coil is placed upon the head. The placing in, and removal from, the bath are done with great care and rapidity; this means close proximity of bath and bed, and both should be at the same level. If there is great tenderness of the back, the sheet may be used to move the patient. The bath must be previously cushioned and thorough after-drying omitted. The patient is placed upon a dry sheet, laid upon a woollen quilt, and covered by the same, over which a light cover is placed; he remains in this position for one hour before removal. The time of the bath is immaterial—early morning or late evening. Nourishing food, even meat, should be given; even diarrhœa, should this occur, does not contraindicate it. Wine, brandy (in milk), also beer, are given, for the author regards alcohol as a tonic and hypnotic of the first rank in this disease.—*Therapeutische Monatshefte*, 1896, Heft 5, S. 254.

Zinc Valerianate in Hay-fever.

Dr. Peter H. Abercrombie recommends this remedy in pill-form, three grains three times daily after meals for one full month before and the same time after the expected onset of the attacks. As local palliative measures he adds a 5 per cent. aqueous solution of cocaine hydrochlorate, and a snuff composed of bismuth and morphine.—*British Medical Journal*, 1896, No. 1842, p. 967.

Cod-liver Oil.

Dr. John T. Winter notes three dangers which threaten the usefulness of this remedy. The first is the result of a modern theory that a part equals the whole. This shows itself in the administration of the so-called alkaloids in place of the oil, when, as a matter of fact, the whole oil must be used if the best therapeutic results are desired. The second is the presentation of the "tasteless" oils, which do not contain any oil at all—a most cruel deception thus to impose upon those who place all their hope for health on this valuable remedy. The third is the unreliability and uncertainty of the emulsions in the market. Therefore, only preparations should be ordered which are reliable and of definite composition. Fortunately, all these dangers

can be removed, but at the same time the facts upon which the remedy rests its reputation must be kept clearly in mind.—*Journal of Medicine and Science*, 1896, No. 7, p. 432.

The Expressed Juice of Carrots.

Dr. S. Artault de Vevey reports the results of the use of this substance in the treatment of impetigo and tuberculosis. Succinic acid possesses a certain reputation as a remedy for tuberculosis, and this suggested these vegetables as a source of it, although they apparently rather stimulate the nutrition than possess any local antiseptic effect. The amount given to children is from one and one-half ounces to three times that quantity of the juice expressed from raw carrots, with a pinch of table-salt. Experiments with rabbits showed that when tuberculous the disease made but little progress, while the animals became fat, partly because carrots, from their richness in sugar, albuminoids, and water, are excellent food for these animals. Further than this, their depurative action would be beneficial in such conditions as impetigo.—*Revue de Thérapeutique*, 1896, No. 9, p. 267.

The Creosote Treatment of Pulmonary Tuberculosis.

Dr. Peter Kaatzer has found that the manner and way of administration are important. Sommerbrodt's gelatin capsules (one and one-half grains with double this amount of balsam of tolu) do not yield all the creosote for absorption, because masses of the balsam still containing creosote are found in the feces. The irritant effect of this drug upon the stomach must also be taken into consideration. The pills are also uncertain, having been found undissolved in the stools. Hopmann's mixture (with tincture of gentian) often produces coughing, and besides is of objectionable taste; when one considers that, in addition, it is often given upon an empty stomach, we find excellent reason for the disfavor in which it is held by the laity. The odor and taste can be concealed by various ethereal oils or by extract of coffee. If the latter is used, there is the additional advantage that the drug is diluted in the stomach. This combination can be given, preferably after meals, in milk or Bavarian beer, but not more than thirty drops of the drug should be given each day.—*Therapeutische Monatshefte*, 1896, Heft 5, S. 265.

Creosote in the Treatment of Tuberculosis of the Upper Air-passages.

Dr. Walter F. Chappell has treated during the past three years thirty-two persons, who had tuberculous deposits in some part of the upper air tract, with this drug internally and locally. The former is attained by the use of equal parts of beechwood creosote and compound tincture of gentian up to ninety drops daily, thoroughly mixed with hot milk. For the latter, solution has been made in castor oil, and applications made, either by means of a dropper or an automatic syringe, when the parts are brought into view in a laryngeal mirror. He concludes that there can be no doubt that the drug, internally and topically, is beneficial at some period in many cases of tuberculosis of the upper respiratory tract. When the ulceration is

extensive and progressing it will occasionally produce cicatrization; in others, it limits the ulceration and modifies the pain and discomfort. The benefits are as permanent as from any other form of treatment. The greatest relief and progress are obtained in the chronic cases, while small ulcerations are decidedly affected by creosote.—*New York Medical Journal*, 1896, No. 910, p. 604.

MEDICINE.

UNDER THE CHARGE OF

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An H_2S-forming Bacillus as the Cause of Croupous Pneumonia.

To the interesting literature concerning H_2S-forming bacteria Johannes Müller (*Centralblatt für innere Med.*, 1896, No. 26) reports the following from the Würzburg clinic: For three weeks a man of fifty-six years complained of loss of energy, headache, and frequent chills. Finally he had a severe chill and other usual symptoms of pneumonia, and when admitted, two days later, presented physical signs of infiltration of the left lower lobe with slight involvement of the left and right upper lobes. There was herpes facialis; the sputum was of characteristic appearance. The urine was clear; chemical examination negative. The patient died two weeks later, having had two pseudocrises, followed each time by renewed infiltration. One day before death the urine was found to be turbid, and the turbidity could not be removed by filtering. Albumin-tests caused but a slight increase in the turbidity. The urine was acid. It had a marked odor of H_2S and gave the usual reaction to lead. Hyaline casts, some of them containing epithelial cells and large numbers of bacilli, were found on microscopic examination. Urine passed later always contained similar bacilli. The sputum and expired air gave no odor of H_2S, but the sputum contained bacilli morphologically identical with those in the urine. The bacilli were cultivated from the urine and sputum and from blood taken one hour after death, producing large quantities of H_2S in the cultures. In the sputum only a few other bacteria were present; in the blood and urine the bacilli were in pure culture. Autopsy showed pneumonic infiltration with œdema and recent pleurisy.

The author thinks the unusually long prodromal stage in this case was due to the peculiar organism, which seemed to be a colon-bacillus or one closely related to the latter. The fact that large numbers of virulent organisms can circulate without producing metastases, and pass through kidneys but slightly altered structurally, is strikingly illustrated.

Carious Teeth and Tuberculosis.

Starck (*Münchener med. Wochenschrift*, 1896, No. 7) has investigated the possible relation of carious teeth to tuberculosis, with valuable and suggestive results. Among 113 children with enlarged cervical glands none of the ordinarily accepted causes could be found in 41 per cent., and attention was called to the coexistence of carious teeth. The enlarged glands nearly always corresponded in position to the affected teeth. In many cases toothache preceded the enlargement, or the caries was evidently primary. When a number of teeth were affected there was often a cluster of enlarged glands; with caries in the early stages the enlargement was often slight. In two cases positive evidence of the relationship of the diseases was adduced. These were a boy of eighteen years and a girl of fourteen years, both healthy previously and with no family history of tuberculosis. Enlargement of the cervical glands followed toothache. In the first case tubercle-bacilli were found in the carious molar teeth. In the other a suspicious-looking granulation was found between the roots of a molar, which, on section, showed tubercles with giant-cells. The importance of these observations in practice is obvious. Their relation to other forms of infection, especially septic, and to the frequent malignant new growths of the cervical region, would seem well worthy of future investigation.

Etiology of Acute Fibrinous Pneumonia.

Bein (*Charité Annalen*, xx. p. 150) reports some cases which throw an interesting light on the etiology of pneumonia. The relation of "cold" is illustrated by the case of a man who attempted suicide by drowning, in which he also received a contusion of the thorax and abdomen by falling flat on the water. In the saliva and sputum virulent pneumococci (demonstrated by injection in rabbits) were found before the occurrence of any signs of pneumonia and before fever. Later, pneumonia appeared and ran an unusually severe and rapid course. The virulence of the infection was also demonstrated by injecting defibrinated blood, obtained by cupping, into a rabbit, which died in eighteen hours. In its blood diplococci were found in considerable number. In the second case the patient, a man, drank spirit of ammonia by mistake. On the second day virulent pneumococci were demonstrated by animal inoculation, but pneumonia did not develop until the seventh day. As the cold in the first case, the depression from the ammonia-poisoning must be looked on in the second as the external or indirect cause, rendering the body susceptible to the action of the pneumococci.

Uricacidæmia in Nephritis.

Von Jaksch (*Centralblatt für innere Med.*, 1896, Bd. xxi.) reports eight cases, in addition to a number reported some years ago, in which uric acid was demonstrated in the blood of persons with nephritis of various kinds. From the later investigations it appears that uric acid is retained in the blood during uræmic attacks.

The Auscultation and Percussion of the Larger Arteries.

Litten (*Centralblatt für innere Med.*, 1896, Bd. xxii.) calls attention to a matter not generally recognized. It is well known that on pressing a stethoscope over an artery a murmur may be heard. This corresponds to a thrill which can best be felt just below the compressed part of the vessel. These phenomena can be brought out over all arteries larger than the radial. They are marked in proportion to the straightness of the artery and the possibility of compressing it against the deep tissues. So they are most distinct over the femorals and the abdominal aorta.

Litten finds that these signs are intensified in certain diseases, such as aortic insufficiency and pseudo-aortic insufficiency, Basedow's disease, and circumscribed arteriosclerosis. The latter is important, because easy to recognize in peripheral arteries; it is difficult when the aorta alone is affected. Symptoms of sclerosis of the abdominal aorta are especially pain in the abdomen, greatly increased by pressure over the aorta; increased hardness and abnormal width of the vessel on palpation, so much so that the inexperienced often mistake it for aneurism. From the great increase in the strength of the thrill in sclerosis, however, the diagnosis can be made. Litten mentions a case in which there were characteristic symptoms of pseudo-aortic insufficiency with pain in the abdomen later. Gradually a pulsating tumor formed in the abdomen, but as there was vomiting of blood the physician was in doubt as to whether the case was one of aneurism or cancer of the stomach. From the signs just described Litten diagnosticated aneurism, which was confirmed post mortem.

The Sudden Appearance and Disappearance of the Romberg Symptom in Tabes.

J. B. Charcot reports the case of an ataxic, forty-three years of age, who had had the disease since the age of thirty. The disease had appeared with gradual loss of vision, which was complete in three years; at the same time he had lightning-pains. There was loss of knee-jerk at this time, but no inco-ordination. Two months before the present attack—that is, thirteen years from the onset of the disease—he was taken with incontinence of urine; and twelve days after this, without apparent cause, the patient suddenly found that he could not walk well. He was unable to stand still on his feet, and, on attempting to walk, staggered like a drunken man. The phenomenon presented all the appearances of Romberg's sign, and was even accompanied by the pain which usually accompanies this sign. The sign gradually disappeared, and at the end of two months the patient was able to walk about as well as ever.

The case is interesting, as Romberg's sign has never been observed in tabetics in whom blindness was the first symptom. On the contrary, the sign is generally wanting even in those who become blind late in the disease. Furthermore, in this case the patient was absolutely free from the symptom for twelve years, and it then came on suddenly. None of the theories proposed to explain Romberg's sign can explain this case.—*Comptes Rendus de la Société de Biologie*, June 5, 1896.

Influenza and Encephalitis.

Nauwerck (*Deutsche med. Wochenschrift*, 1895, No. 25) reports two instructive cases. A girl of fourteen years was seized with fever, vomiting and convulsions in the left arm and leg, followed by paresis of the left side, and stupor. Two weeks from the onset death occurred, after unconsciousness and convulsions. Autopsy revealed thrombosis of the sinuses and the veins of the pia and numerous softening foci with capillary hemorrhages in the brain, especially in the upper third of the right anterior central convolution. Microscopical and bacteriological examination, including inoculations in animals, failed to reveal influenza-bacilli or other micro-organisms. In the second case, a girl of nineteen years had headache, vomiting, contracted pupils, and loss of reflexes to light, infrequent pulse, coma, and jactitation, and died in forty-eight hours. On post-mortem examination the ventricles of the brain were found distended, there was an apoplectic focus in the cerebellum, and small capillary hemorrhages in the brain and cord. Pfeiffer's influenza-bacilli were cultivated from the fluid in the ventricles. The bacilli were found also sparingly in the inflammatory foci in the cerebellum. This case shows that the brain may become rapidly infected in influenza without showing signs of the point of entrance other than mild coryza. Perhaps there is primary influenza-encephalitis in which a temporary blood-infection leads at once to a localization in the central nervous system. The fact that the fluid of the acute hydrocephalus contained the specific organisms is of interest.

Adenopathies in Rheumatism.

Chauffard and Ramon have recently examined a number of cases of relapsing rheumatism for glandular enlargement in cases in which they suspected an infectious origin. In many of the cases examined it was found that the glands, sometimes in the immediate neighborhood of the affected joints, became swollen at the time of the attack. In most of the cases there was some pain in the swollen glands. The swelling of the glands was so appreciable in some cases that the patients had noticed it themselves, and had also noticed that it increased with the exacerbations of the disease.

Cultures made on various media from one of the cases were negative, but cover-slips from the joint-liquid and neighboring enlarged glands both showed a diplo-bacillus.

Histologically the enlarged glands showed the lesions of lymphatics with increase in the trabeculæ of the glands.

The authors regard this glandular enlargement as further proof of the infectious character of rheumatism.—*Revue de Médecine*, May, 1896.

The Resistance of the Organism to Prolonged Refrigeration.

Lefèvre has recently investigated the effect of the prolonged action of cold baths on the healthy individual.

The experiments were carried on by seating the patient in a bath, the water reaching up to the nipple-level, and taking the axillary temperature at frequent intervals.

Two sets of experiments were made—in the one, the subject remaining in the water three hours, the water being at a temperature of 25° C.; and in the other, the same length of time with the water at 15° C.

The same results were obtained in both cases, and the author draws the following conclusions:

1. There is first a stage of excitement, during which the temperature of the body is elevated.

2. Following this about fifteen minutes there is a stage of depression, which lasts twenty to twenty-five minutes. During this stage the internal temperature decreases.

3. Finally, after an insignificant oscillation, the internal temperature remains at a fixed point. For two and a half hours the coefficient of resistance, almost non-varying, remains at the fixed point, and one can say that the body-resistance is perfect for this length of time.—*Comptes Rendus de la Société de Biologie*, May 22, 1896.

Elective Sensory Paralysis.

Barker, of the Johns Hopkins Hospital, in the *Journal of Experimental Medicine*, vol. i. No. 2, describes a case of circumscribed unilateral and elective sensory paralysis. By elective sensory paralysis he understands one in which certain only of the functions of the sensory nerves (touch, cold, warmth, pain, and sensation) are abolished. The observations were made upon his own arm, the disturbance being limited to the inner side of the arm and forearm of the left side in the distribution of the nervi cutanei brachii et antibrachii mediales, and depending apparently on the presence of a cervical rib. At certain times he has had sensations of numbness and formication. There has been no disturbance of motility, nor have alterations in the muscles or the skin been perceptible. Sweat-secretion is normal; goose-skin in the affected area occurs exactly as in normal areas. In his investigation the author endeavors to determine exactly the extent and kind of disturbance of sensibility qualitatively, and as far as possible also quantitatively. The sensation for cold, warmth, pressure, and pain was examined, and the distribution of the different sense-points and their threshold-stimuli were carefully determined with exact methods of localization and measurement. The methods of study are all carefully described.

In the area of disturbed sensation sensations of warmth, cold, pressure, and touch were absent, nor could any tickling sensation be elicited there. The sensation of pain was apparently intact, but on accurate testing a slight diminution in the number of pain-points could be demonstrated. The limit of the area was, on the flexor surface of the forearm, sharply and regularly defined, but on the extensor surface was very irregular, invading by deep indentations the normal area, and passing over into the latter only gradually. Nor did the limits for cold, warmth, and pressure-sense entirely agree, single sense-points or groups of sense-points of one kind being found in places where none of the other sense-qualities were represented. The threshold-stimuli for points remaining functional within the anæsthetic area correspond to normal threshold-values. In addition to the study of the merely clinical side of the case Barker made a number of special observations with regard to the

physiological relations of the different kinds of sense-points. The occurrence of isolated points and groups of points made the case especially suitable for the decision of certain disputed physiological questions.

Among other things, an attempt was made to determine the smallest amount of heat, the subtraction of which could lead to the reaction of a cold point, and for this the value 0.0024 calorie was obtained. Of twenty cold points examined, eighteen different threshold-values were found lying between the amount of heat just mentioned and a point twelve times as great. The "paradoxical" cold sensation of V. Frey was examined on some fifty cold points of the same area by Kiesof, the majority of these yielding on the application of temperatures of from 40° to 60° C. exclusively the sensation of cold. The relation of the pressure-points to the hair-follicles was confirmed, and in the anæsthetic area the hair-follicles, which though present did not react to pressure, failed also to yield the characteristic oscillatory or buzzing sensation on faradic stimulation. A series of influences, which in normal regions at first evoke other sense-qualities and only subsequently give rise to pain-excitation, called forth in the area of elective paralysis exclusively pain-sensation; thus, for example, pricks with a fine needle excited only a feeling of pain without giving rise to previous touch- or pressure-sensations, and were answered by lively reflexes.

Barker was able to prove further that the so-called temperature-pain is dependent on irritation of the pain-points by heat or by cold, as it can be produced in areas where cold points and warm points are entirely absent. It is, therefore, wholly independent of the temperature-sensations which on the normal skin accompany it or precede it. The capacity for localization within the anæsthetic area where pain exclusively is felt is very incomplete.

The phenomena in the case, clinically speaking, are essentially phenomena of absence, a number of nervous functions peculiar to the normal skin not being present. Phenomena of irritation were by no means prominent.

The author concludes that the cause of his disturbance is peripheral, and refers to other cases in which through pressure of a cervical rib disturbances of sensibility and motility have resulted.

The possibility of localization in the nerve-roots or cord is excluded. The abolition of temperature-sense and the sense of touch with retention of pain-sense represents only one of the numerous variations possible in elective injuries of peripheral nerves, and cases are cited from the literature which substantiate this statement.

For a number of other physiological considerations the original article must be consulted.

The Gastric Juice in Tabes Dorsalis.

Nuchard and Boret have recently reported some cases of tabes associated with gastric crises, in which they made careful examinations of the gastric juice.

They found great variability in the reaction of the gastric juice, the changes in reaction occurring with great rapidity, so that a patient who had had a hyperacid gastric juice for a week or more would suddenly be found to have a subacid one, and *vice versa*. From the character and rapidity of these changes

they regard it as very difficult to explain the lesion present upon anatomical grounds. The authors are inclined to think that this great variability in reaction may be a valuable diagnostic point in distinguishing gastric crises with hæmatemesis from wound-ulcer of the stomach.—*La Progrès Médical*, February 15, 1896.

The Favorable Effects of Pneumothorax on Pulmonary Tuberculosis.

Janovsky reports some cases of pneumothorax, occurring in connection with pulmonary tuberculosis, which lead him to believe that this complication at times has a favorable effect upon the lung-process. In four of eight cases which he abstracts from Najnikoff improvement followed the perforation. Najnikoff explains this on the grounds that the pleural exudate which resulted from the pneumothorax compressed the lung-tissue and rendered it anæmic, an arrest of the lung disease resulting from this anæmia.

Janovsky's own case occurred in a young girl, who, after a three months' illness, had all the signs of cavities at the bases, the process of consolidation reaching the apices at the end of five months. At this time a perforation into the pleural cavity occurred with signs of pneumothorax, but practically no effusion.

The patient immediately began to improve, and gained thirty pounds in weight in a comparatively short time, the lung showing signs of induration.

The pressure on the lung from an exudate could not explain this case, as practically no exudate was present.

The author explains the beneficial result on the grounds that with the pneumothorax the negative pressure in the pleural cavity disappeared and the lung collapsed; the inspired air, instead of entering the lung, entered the pleural cavity through the perforation, and compressed the lung, much as the exudate had done in Najnikoff's cases.—*La Presse Médicale*, February 1, 1896.

Hysterical Hæmoptysis.

Mathieu and Milieu have recently investigated the blood-stained expectoration of several hysterical patients who came under their observation.

The expectoration of the blood-stained material occurred either in the morning or at night, about three or four hours after retiring. The material had the appearance of red currant-juice mixed with water, or in some intances that of syrup of rhatany; it never coagulated. The quantity of fluid varied from sixty to one hundred grammes, and was usually all expectorated at one effort.

The expulsion of the fluid was often preceded by a sensation of burning at the pit of the stomach, or perhaps by an aura simulating an abortive hysterical attack. Vomiting of food never occurred. At times epigastric tenderness was noted just to the right of the median line in the pyloric region. The attacks often occurred every day for two or three weeks, and were sometimes replaced by true hysterical attacks. The ejected liquid, on standing, settled into two layers—a clear upper layer and a lower darker layer. The upper layer contained no formed elements, the lower contained mucus and

white and red blood-corpuscles. The reaction at times was acid, indicating the presence of gastric juice; at times alkaline, when the fluid elements were mostly saliva. The proportion of blood to saliva was about one to twelve.

It seems probable that the blood can come from the stomach, the tonsils, or the tongue.—*Gazette Médicale de Paris*, February 1, 1896.

Herpes Facialis as a Symptom of Bacterial Intoxication.

Friedreich (*Berlin. klin. Wochenschrift*, 1895, Nos. 49 and 50) made some experiments with cultures of streptococci, as used by Coley in the treatment of malignant disease. In seven cases herpes facialis was observed. All these were cases in which sterilized cultures of streptococcus and prodigiosus were used. The eruption appeared not earlier than thirty nor later than fifty-eight hours after injection, and in two cases was followed by recidiva. As there was no infection in these cases, the herpes must be looked on as due to intoxication.

The Blood in a Case of Metastatic Cancer of the Bone.

J. Epstein (*Zeitschrift für klin. Med.*, Bd. xxx. H. 1 and 2) has studied the condition of the blood in a case of scirrhus of the mamma with extensive metastases, including the marrow of many bones. The red corpuscles showed great variation in size, from 5 to 10 micromillimetres; there were many nucleated red corpuscles, including many megaloblasts with bizarre nuclei. The bodies of the red corpuscles showed degeneration. The leucocytes were greatly increased—from one to twenty-five to one to forty red. There were large neutrophile marrow-cells. Only two eosinophile cells were present. Epstein thinks the condition of the leucocytes was due, not to the cancer alone, but to atypical growths of blood-forming tissue in the marrow.

A Case of Diphtheria Treated with Concentrated Serum, with Remarkable Symptoms.

Auersbach (*Centralblatt für innere Med.*, 1896, No. 18) saw a patient on the second day of a moderately severe diphtheria, with a dirty-green membrane on the tonsils and palatal arches, painful swellings in the neck, and a temperature of 103° F. He injected 2 c.cm. of concentrated serum, equivalent to 100 units. The temperature fell, but the membrane extended. Liquor ferri was swabbed locally, and the membrane finally disappeared by the tenth day. The swelling in the neck increased so much that suppuration was feared. A second injection was being considered when, on the fourth day, a typical erythema exudativum *seu* nodosum appeared over both ankles, with great pain and œdema. Next day a similar eruption appeared over the smaller joints of the feet, the knees, and hips, with swelling in the joints. There was also a scarlatinous eruption on the back. During the next few days the eruption involved the joints of the arms, so that all motion was painful. Slight fever continued all this time. Menstruation appeared and was excessive. Albuminuria was present, without casts, and continued up to the time of the report, two months later. The erythema and joint-symptoms

were not affected by sodium salicylate. On the twenty-third day the symptoms seemed to be disappearing, but on the twenty-fourth periostitis began on the tibia and ulna, and lasted a week. No explanation seemed possible for the remarkable complications in this case.

SURGERY.

UNDER THE CHARGE OF

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CATGUT-STERILIZATION.

HOFMEISTER (*Centralblatt für Chirurgie*, 1896), after referring to the different methods of catgut-sterilization that have been employed in Braun's clinic at the University of Tübingen, recommends the following process, the value of which depends upon the capability of formalin of acting on lime-substances so that they lose their solubility in boiling water:

1. Harden the raw catgut, which has been previously wrapped upon rolls, in 4 per cent. solution of formalin for twenty-four hours.

2. Boil in water for ten minutes.

3. Harden again in the formalin solution and preserve in alcohol, to which 5 per cent. glycerin and 1 per cent. sublimate or other antiseptic in suitable quantity has been added. The strands remain from the beginning of the sterilization on the same rolls, so that touching with the fingers may be avoided. It is necessary to wind the catgut before beginning the sterilization, because the loose catgut rings entangle when placed in the solution and in boiling become converted into unravelled balls. When putting the rolls into the solution of formalin much care has to be taken to remove the great number of air-bubbles which remain among the strands, so as to have the finished preparation uniformly firm. The tensile strength of the sterilized threads which were examined with a dynamometer compared favorably with the raw catgut.

Bacteriologic investigation showed the prepared catgut to be free from spores.

In the *Semaine Médicale*, 1896, No. 3, there is a note in which HLAVACZEK also confirms the fact of the resistance of formalin catgut, and states that the Society of Physicians at Vienna proposes a procedure which resembles the one described, both of which are in confirmation of Hofmeister's studies.

Modern Methods of Gastrostomy.

Chavasse, in a clinical lecture on this subject (*The Lancet*, London, 1896, vol. ii. No. 1), describes the following modern operations: (1) Hahn's, 1890; (2) Witzel's, 1891; and (3) Albert's, 1892.

In Hahn's method the abdomen is opened by a transverse incision below the ribs, and, the stomach having been exposed, a second incision is made in the left eighth intercostal space, through which the organ is drawn out and fastened between the cartilages; it is then opened. The idea is that the ribs will act as a stopcock and so prevent leakage. In the only example the author saw of this method this object was not attained during the ten days the patient survived the operation, and it certainly appeared to give rise to more pain than the ordinary operation; it is also possible to wound the pleura or the diaphragm, or a necrosis of the cartilages may subsequently supervene.

In Witzel's method the primary incision commences in the middle line, a finger's-breadth below the left costal cartilages, and is carried transversely outward for three or four inches. The rectus muscle having been laid bare, its fibres are separated by the handle of the scalpel, held apart by retractors, and the peritoneal cavity opened. A portion of the stomach is now drawn outside, packed around with warm sponges, and opened on its anterior surface by a small incision placed near its cardiac end, sufficient to permit the introduction of a fair-sized drainage-tube. The tube should be about five inches long, and about one inch of it should be inserted into the cavity of the stomach and anchored there by two or more sutures which penetrate the muscular and peritoneal coats of the organ and the India-rubber tube so as not to open its calibre. Silk sutures are next passed half an inch from the tube through the muscular and peritoneal coats of the stomach, over the tube and through the corresponding coats on the other side of it. From four to six sutures may be so inserted, but all should be passed before any tying is attempted. When this is done the tube will be found encased in a peritoneal funnel, except at its upper part. If necessary, other superficial sutures may be added between the deeper ones. Four or five silk sutures on either side are next employed to secure the viscus to the cut edges of the abdominal wall, and the wound is lightly packed with iodoform-gauze. If deemed necessary, milk or other nutriment may now be injected through the tube; but it is preferable to wait twenty-four hours, when some adhesions will have formed.

Albert's method: An incision two fingers'-breadth below the margin of the left ribs is carried downward and outward over the rectus muscle for three or four inches, and its fibres having been exposed are separated vertically toward the inner edge of the muscle by the handle of the scalpel or some blunt instrument. The peritoneal cavity having been opened, a sufficient portion of the stomach to reach the costal cartilages is drawn out of the abdomen. It is then anchored in that position by stitching with continuous or interrupted silk sutures on each side of the serous and muscular coats of the organ to the parietal peritoneum and the posterior layer of the rectal sheath. Through the skin at the level of the cartilages, about one inch from the outer edge of the wound in the parietes, a small incision, half

an inch long, is made, and a bridge undermined between this and the primary incision. Under this subcutaneous bridge the extruded portion of the stomach is drawn upward, and a small opening having been made into its cavity by incising its anterior wall, the edges of this mouth are secured by four or more fixation-sutures to the edges of the small skin-wound. The first incision in the abdominal wall is then completely closed. As a result of this procedure a portion of the stomach becomes subcutaneous, is bent forward, and forms a sort of artificial œsophagus, the back of which is gripped by the muscular fibres of the rectus, which act as a sphincter.

The chief difficulty experienced by patients after gastrostomy has been the leakage from the fistula, especially during the process of digestion. As a consequence, the skin around the orifice becomes the seat of a chronic eczema, which is very troublesome to the patient.

In comparing Witzel's and Albert's operations the author states that one is as readily performed as the other, but occasional difficulty will be experienced in drawing the stomach forward and upward sufficiently in the latter method on account of the organ being fixed by the neoplasm. More gastric and general disturbance follows its performance than that of Witzel's, due to the necessary traction on the stomach-wall. The opening into the viscus is also apt to contract somewhat under the bridge of skin. When complete, however, it has the advantage over Witzel's method in that no tube need be worn. It would be more difficult, the author states, to close the fistula, if required, after Albert's than after Witzel's operation; but in most cases the operator desires the opening to remain permanently. Both methods give satisfactory results as regards the absence of leakage, and both are very distinct advances on the older methods.

The Operative Treatment of Dilatation of the Stomach.

Ewart and Bennett describe in *The Lancet*, London, 1896, vol. ii. No. 1, an operation for dilatation of the stomach which they believe to be new.

The abdomen having been opened by a median incision about five inches long, commencing above at a point an inch below the ensiform appendix, the stomach was thoroughly examined by the hand introduced through the wound. No adhesions were detected and the pylorus was normal. The viscus was then drawn out of the abdomen and laid upon the parietes, where it presented a large balloon-like bag distended with gas. A fold on the anterior aspect of the stomach was then turned in by the fingers of the assistant. The length of this fold, which followed the direction of the long axis of the stomach, was about twelve inches, its greatest depth being about three inches. While this fold was held involuted by the assistant's fingers the peritoneal surfaces on the opposite sides of its base were brought together by numerous sutures made to transfix the peritoneal and muscular coats, the fingers of the assistant being gradually withdrawn from the fold before the tightening up of the final stitches. After the stitches had all been fastened off the size of the stomach was greatly lessened. Mr. Bennett had intended to make a small secondary involution at the great end of the stomach to prevent the otherwise inevitable dependent tendency of that part; but as the patient was in a very unsatisfactory condition generally, it

was thought wiser to be content with what had already been done. The altered viscus was then returned into the abdomen, the wound in the parietes being closed by fishgut sutures in the usual way.

The patient presented the ordinary symptoms of dilatation of the stomach in a marked degree. He had had the benefit of the various forms of palliative treatment without any relief. The patient, after leaving the hospital, was able to resume his work, which was that of a carpenter.

Under the title of "Gastropexy," DURET describes in the *Revue de Chirurgie*, June 10, 1896, an operation for the condition of dilatation and downward displacement of the stomach, which is known as gastroptosis or Glenard's disease. The operation is performed as follows: An incision four inches in length is made in the middle line of the abdomen, beginning at the ensiform cartilage. The peritoneum is divided only in the lower half of the wound, the upper portion being left undivided to receive the sutures which hold the stomach in place. The pylorus and lesser curvature are then fixed to the anterior abdominal wall as follows: The stomach having been raised and placed in its normal position, a silk suture is made to include the serous and muscular coats of the pyloric extremity, and is then passed through the overlying portion of exposed peritoneum from within outward. The suture is carried backward and forward in this way until the stomach has been well anchored. The external wound is closed layer by layer.

PERFORATING ULCER OF THE DUODENUM.

J. COLLINS WARREN records a case of perforating ulcer of the duodenum in the *Boston Medical and Surgical Journal*, 1896, vol. cxxxiv. No. 19. The patient was a man, sixty-two years of age, who had suffered six years previously from a sudden, violent attack of abdominal pain, with great distention and constipation. Since that time he had had frequent attacks of acute pain in the pyloric region, for which he usually took a quarter of a grain of morphine.

When seen by Dr. Warren the patient had pain and tenderness in the right hypochondrium, extending downward toward the right iliac fossa. The temperature was 100.5° and the pulse 100.

The symptoms were thought to be probably due to perforation of the appendix, and as the patient's condition was unsatisfactory an exploratory operation was performed. The appendix was found to be normal, but as the exploration was continued in the direction of the right hypochondrium a perforation of the duodenum was discovered. About the perforation was an area of inflammation and the adjacent coils of intestine were glued together, partly closing off the general peritoneal cavity. The opening in the duodenum was closed with silk Lembert sutures, drainage was introduced, and the parietal wound was closed. Death occurred on the third day. After operation there were great thirst and vomiting of a brownish substance. There had been no motion of the bowels.

THOMSON reports in *The Lancet*, London, 1896, vol. ii. No. 1, three cases of operative interference for perforated ulcer of the stomach, two of which made excellent recoveries. The author states that it has been amply shown that life is to be saved by prompt operation in these cases. More precise

knowledge is still required, however, in (1) the accurate diagnosis of the occurrence of perforation; (2) the most favorable period for surgical interference; and (3) the best method of dealing with (*a*) the perforation when found, and (*b*) the extravasation into and infection of the peritoneum. The mortality in these operations, as has been shown by Weir, bears a direct relation to the time that has elapsed between the perforation and the operation. The author does not consider it wise to wait until the shock which follows the perforation has passed off. He recommends the administration of whiskey and hot water by the rectum and strychnine hypodermatically, and to proceed at once with the operation. The ulcer is best dealt with by simply invaginating by means of Lembert sutures. A considerable area of stomach-wall should be included in the suture. If the perforation is in the neighborhood of the pylorus, this may entail an undesirable degree of stenosis if the suture-line corresponds with the long axis of the stomach. In such cases it is better to make the suture-line at right-angles to the axis of the pylorus, after the principle of the Heinecke-Mikulicz operation for pyloric stenosis. The extravasation into the peritoneal cavity is best dealt with by a copious flushing with saline solutions at a temperature of from 105° to 110° F. If there is general infection of the peritoneum, the author drains by means of tubes the pouch of Douglas, and, if necessary, a tube is passed through an incision in the loin below the right kidney to drain the lumbar pouch. A tube may be placed to drain the area around the ulcer, but this is the least important of the three.

Rupture of the Urethra Treated by Immediate Suture and Bladder-drainage.

Weir reports (*Medical Record*, New York, 1896, vol. xlix. No. 19) two cases in which he performed immediate suture for rupture of the urethra—one on the fourth day, and the other thirteen hours after the injury. In the first of these a small suprapubic opening was made in the bladder, and a soft-rubber catheter inserted for drainage.

The following is a summary of the article:

1. In an injury of the perineum with painful or difficult urination, accompanied with a free flow of blood, with or without a perineal or scrotal swelling, a free perineal incision should be made and the urethra exposed. 2. If this canal be ruptured partially or totally, the separate ends should be sewed together with silk or catgut. 3. Drainage of the bladder should be employed either by a catheter by the urethra, or preferably by a suprapubic opening. To aid in carrying out the latter Cathcart's or Dawbarn's method of siphonage should be employed.

The author prefers pure silk for sutures, with which he includes the mucous membrane and other coats of the urethra. These are supplemented by two or three extra urethral sutures to relieve the tension on the urethral sutures. One or both ends are left long and are brought out of the wound so that traction may be made on them at the end of a week or ten days. Weir was much impressed with the value of bladder-drainage after the method devised by Cathcart.

In the cases of complete rupture of the urethra in which the vesical end cannot be found, it is recommended to douche the wound for five or ten

minutes with hot antiseptic solution, when the divided urethra will be more or less distinctly revealed.

The Treatment of Irritable Spine.

Under this title Gibney (*Medical Record*, New York, 1896, vol. xlix. No. 19) includes those cases variously described as spinal hyperæmia, spinal necrosis, and hysterical spine. These cases usually exhibit spinal tenderness, various pains in the course of the nerves, a weak back, fatigue on little exertion, lack of symmetry between the scapulæ, obliquity of the pelvis, etc. The author describes a typical case as follows:

"A lady who has borne one or two children has for a year or more complained of her back; has had remissions of pain followed by rather sharp exacerbations; has been quite active at times; has presented a tenderness over the spinous processes and lateral masses, with pains occasionally in the course of the lumbar or lumbosacral nerves, and has gotten into the habit of standing awkwardly in order to rest herself. This awkward position has produced an obliquity of the pelvis and a compensatory scoliosis, a simple, lateral deviation of the column. I find her fairly well nourished and get a pretty good history negatively of the internal organs. Examination of the column reveals, as just indicated, a lateral curvature in the lumbar region to the right or left side, very slight, and an inequality of the iliocostal spaces, also very slight; sometimes a lack of symmetry between the scapulæ, sometimes an antero-posterior curvature of the spine, the correction of which causes increased pain in the back, a spinal tenderness, and sometimes tenderness on concussion. By equalizing the two sides of the pelvis I am able usually to demonstrate the compensatory nature of the curvature, and by testing the columns as to flexibility I am able to rule out any bone-lesion."

It is frequently necessary to distinguish these cases from curvature of the spine.

The treatment consists in counter-irritation, the administration of tonics, graded exercises, out-of-door life, and, in obstinate cases, a spinal assistant. As a counter-irritant the author prefers the Paquelin cautery, applied with very light strokes three times a week for a month or six weeks. In some cases he uses fly-blisters or mustard-plasters, the latter being applied every night for one or two weeks. After the immediate effects of the counter-irritant have passed it is recommended to apply strips of adhesive plaster over the sensitive area. They are cut three or four inches long and one inch wide, and are arranged criss-cross over the spinous processes.

A New Apparatus for Immediate and Permanent Drainage of the Urinary Bladder after Suprapubic Cystotomy.

Bloodgood describes in the *Bulletin of the Johns Hopkins Hospital*, 1896, vol. vii. No. 61, an apparatus which he has found to drain effectually the urinary bladder after suprapubic cystotomy. It prevents leakage of urine and the consequent soiling of the patient and irritation of the surrounding skin which are so constantly observed in these cases.

The apparatus consists of a rubber-bag reservoir, 18 x 12 cm. in diameter, and holds about 350 c.cm. It has been found in practice that patients usually empty

the reservoir when about 250 c.cm. of urine have collected. Sealed to the upper and central portion of this bag is a thicker piece of rubber with a small opening in its centre, into which the head of the hard-rubber tube that drains the bladder is inserted. The ends of the abdominal belt are also fastened to this piece of rubber. The abdominal belt supports the entire weight of the bag, so that there is no dragging on the drainage-tube. Two rubber tubes lead from this reservoir, the lower one being used to draw off the urine and the upper one to wash out the bag. Both are provided with stoppers.

The drainage-tubes for immediate and for permanent drainage differ. That for immediate drainage is made of hard rubber, and consists of three pieces—a head 2 cm. long, with a flange at one extremity and a thread cut on the balance. This flange is to be inserted into the hole in the bag, the elasticity of the rubber making a snug fit; a saucer-shaped piece with a thread to fit the former is screwed on the head, thereby grasping the bag firmly and preventing leakage of urine, and a straight tube 10 to 15 cm. long and 1.5 cm. in diameter; 1.5 cm. from the vesical end is a flange 5 mm. in width, pierced by four holes. This piece also screws on the end of the head that projects from the bag.

The tube is put in place by introducing four silk sutures through the bladder-wall, not including the mucous coat, and passing the inner ends of the suture through the corresponding holes in the flange of the tube. The posterior surface of this flange rests on the anterior surface of the bladder. The sutures are tied, but not cut, the ends being carried out of the wound.

The tube for permanent drainage has no flange; it should project into the bladder at least 1 cm.; the vesical end should be slightly bulbous and either straight or curved, according to the direction of the sinus.

For immediate drainage a rubber tube can be attached to that connected with the reservoir, and continuous drainage into a vessel at the bedside obtained.

In the last two cases a purse-string suture was placed in the bladder-wall around the tube, in addition to the four sutures mentioned.

The Next Great Advance in Anæsthesia.

In an address on this subject (*The Lancet*, London, 1896, vol. i. No. 16) before the Society of Anæsthetists Sir Benjamin Ward Richardson, after describing the disadvantages of the anæsthetic agents at present employed and his view of the manner in which these agents act, states it as his belief that a substance should be found which will destroy sensation without affecting consciousness. He says: "I look hopefully for a method in which, by means of a single agent, we shall be able at will to suspend common sense alone or to exalt the process into suspension of consciousness." The author has found that the element chlorine is a dangerous substance to be combined with an anæsthetic. It is this substance that renders chloroform so unsafe for the production of general anæsthesia. Richardson has used bichloride of methylene with success. It has, however, to some extent the same objectionable features as has chloroform. He thinks that methylic ether possesses the best qualities for producing general anæsthesia. The objection is that it is a gas and somewhat difficult to handle. This substance destroys sensibility

before consciousness, and recovery from its effects is exceedingly rapid. The author cites a recent death from chloroform, and calls attention to a too common error in the administration of all anæsthetics.

The patient was a healthy young man who submitted himself to the narcotic for the operation of tooth-extraction; he was fully examined beforehand and gave no indications of disease; he inhaled with readiness; the operation was performed dexterously; the chloroform was perfectly pure; and the post-mortem appearance afforded no evidence of the cause of the collapse. These frequent recurrences of deaths supports the conclusions already advanced as to the danger attendant upon the reception of all bodies of the chlorine series, and they also suggest that every specimen of that series should be administered slowly and in small quantities, so that narcotism should be induced by eighteen to twenty minims at the most. The question of small and slow administrations is one of the most critical, and makes a distinction between surgery proper and anæsthesia, which is of vital importance. When there was no anæsthesia surgical art was of necessity predominant. That surgeon was the most brilliant man who could operate most quickly and, with a steady nerve, could perform any possible operation. As the result of the work of ages it became natural that surgery should still in our days hold the first place, and that although in nineteen cases out of twenty the surgical operations might be mere bagatelles as compared with the production of unconsciousness by a narcotic agent, it has required a long time and a hecatomb of deaths for the fact to be demonstrated that the work of the anæsthetist calls for the first and most serious consideration. The old conception has continued to keep surgery in its original state and to cause anæsthesia to be looked upon as a mere adjunct. There is another element of danger in respect to the question of time. As in surgery brevity was the primary process, it came to be expected, both by the public and by the profession, that brevity in anæsthesia ought to keep pace. Thus, during an operation the surgeon expects the completest insensibility, and, not getting it, spurs on the anæsthetist to be as brief as he wishes to be himself—a direction which the administrator, by habit, is as willing to obey as if he were simply an adjunctive aid. In the future all this must be changed. The anæsthetist must know and feel that he must be left quite independent in producing painlessness, while the surgeon, however brilliant, must follow his lead and not think of operating until the patient has been pronounced by the administrator safe, senseless, and ready for the knife.

Ulcerative Endocarditis due to the Gonococcus. Gonorrhœal Septicæmia.

Thayer and Blumer, after an exhaustive historical review of this subject (*Bulletin of the Johns Hopkins Hospital*, 1896, vol. vii. No. 6), record a very carefully observed case which they believe justifies the conclusion that the organism present in pure culture in the circulating blood (during life) and on the affected valves of the heart (at the time of the autopsy) was the gonococcus of Neisser, because:

(*a*) Its form and arrangement were characteristic.

(*b*) While present, free, the cocci were frequently found crowded in the protoplasm of leucocytes in the thrombus on the valve.

(*c*) It refused to grow upon the ordinary media.

(*d*) It grew readily upon a mixture of human blood and agar-agar (one-third blood).

(*e*) It decolorized when treated by Gram's method.

The question of the point of entry arises, of course, immediately. Nothing definite was known of the manner of life of the patient before entry. The fact that cover-slips from the vagina and the interior of the uterus showed similar diplococci, decolorizing on treatment according to the method of Gram, leaves little doubt that the infection took place through the ordinary channels.

OTOLOGY.

UNDER THE CHARGE OF

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Nasal Hypertrophy and Ear Disease.

MacNaughton Jones (*V. Internat. Otol. Congress: Annales des Mal. de l'Oreille*, vol. xxii.), after careful investigation into the causative relation between hypertrophy of the turbinates and deafness, based upon an examination of 300 cases of aural disease, in which he found only 69 hypertrophies of the turbinates and 18 deviations of the septum, concludes that in only a quarter of the cases can nasal obstruction be regarded as causative of deafness. It is his opinion that too much and too severe treatment has been directed toward hypertrophies of the turbinated bodies as a means of curing deafness. Especially to be condemned is turbinotomy in such connections.

Adenoids in Relation to Deafness.

Arslan (*V. Internat. Otol. Congress: Annales des Mal. de l'Oreille*, vol. xxii.), in an article on adenoid vegetations in the nasopharynx, concludes, regarding their origin, "that heredity and the dyscrasiæ are the chief etiological factors, while a damp climate and infective processes act as a subordinate part in the causation of these growths. The operation for their relief should be performed at one sitting. The knife of Moritz-Schmidt should be used, to be followed by digital crushing. Bromide of ethyl is the best anæsthetic in the ablation of adenoids, being incomparably superior to chloroform, ether, and perhaps to nitrous oxide. Adenoids should always be removed, even when small; and all children, before being accepted into schools, institutions for the deaf and dumb, and other places of education, should be subjected to a nasopharyngeal examination."

In the discussion which followed Helme maintained that the introduction of the finger into the nasopharyngeal cavity after the operation, to assure one's self of the completeness of the latter, is a *septic* procedure.

GRADENIGO (*loc. cit.*) opposed irrigation of this region either before or after operation, especially in children, since, on account of the width of the Eustachian mouth in them, the injections easily enter the middle ear and set up an otitis media. As "blood is certainly the best of antiseptics," it should be allowed to flow, in reason, after operations. In these views Gradenigo was sustained by Brieger. Moure, however (*loc. cit.*), did not share the fears of Helme regarding infection of the lacerated tissues in the nasopharynx by the index-finger of the operator.

THE THYROID GLAND AND THE MIDDLE EAR.

SPEAR (*Boston City Hospital Med. and Surgical Reports*, 1896) claims, as a result of his own observations, that the thyroid gland is "the centre of a nervous system which controls, through connections with the sympathetic ganglia and distant nerve-centres by a peculiar inhibition, all the blood-vessels and the centre of the circulatory system, the heart itself." He gives a number of cases tending to prove that frequently aural symptoms—tinnitus and deafness—accompanied by enlargement of the thyroid, are due to diseases of this latter organ, and are relievable more or less entirely by hot-water applications to the thyroid gland. This treatment relieves the congestion and stasis in this gland, as well as these conditions in the turbinates and Eustachian tube, brought about by the engorged state of the thyroid. In this way he frequently relieves tinnitus and deafness, concomitant neurasthenia being combated by proper remedies.

FERRERI (*V. Internat. Otol. Congress: Annales des Mal. de l'Oreille*, vol. xxii.) has shown that the predominant senile change in the middle ear is atrophy of the bone, particularly of the ossicula, the most important elements in the transmission of sound. In no instance (201 old persons) has he found primary lesions of the labyrinth. The deafness of old age, he concludes, is not due to changes in the middle ear similar to ordinary sclerosis, but rather to a primary lesion of the joints of the auditory ossicles, the result of trophic nerve-changes.

In the discussion following (*loc. cit*) GRADENIGO claimed that senile deafness is due to a general senile involution extending to the sound-transmitting rather than to the sound-perceiving apparatus.

POLITZER claims that the deafness of old age is due to osseous changes around the oval window, while MASINI (*loc. cit.*) agrees with the views of Ferreri as given above.

AURAL VERTIGO AND SO-CALLED MÉNIÈRE'S DISEASE.

MACNAUGHTON JONES (*British Med. Journ.*, 1895, No. 23) describes a case of apoplectiform, labyrinthine vertigo, and limits the term Ménière's disease to such an affection. The term Ménière's symptoms may be applied to vertiginous conditions evoked by middle-ear disease. In these views he is upheld by PRITCHARD and BARR (*loc. cit*). The same suggestions were made by C. H. BURNETT in 1882 (*Philadelphia Medical Times*, June 3d).

Hyperæsthesia acustica may exist in connection with ear-vertigo, as in a case reported by MacNaughton Jones (*loc. cit.*).

LEMAIREY (*Ann. des Mal. de l'Oreille*, vol. xxi.), by the administration of

pilocarpin in a case of Ménière's labyrinthine disease, abrogated the vertigo and increased the hearing. Relapses occurring one and then three years later were cured by quinine, according to the method of GELLÉ (*Annales des Mal. de l'Oreille*, vol. xxii.). According to Gellé (*loc. cit.*), "the premonitory sensorial phenomena, either sensory or motor, of an attack of ear-vertigo show that irritations of the auditory nerve produced in man not only various perturbations of equilibrium and of movements which have been studied and are well known, but also they act upon the psychic centres and provoke veritable hallucinations of sense and motion which only clinical observation can disclose to the physician."

OBJECTIVE NOISES IN THE EAR.

KAYSER (*Archiv f. Ohrenh.*, vol. xxxix.) divides objective aural sounds into two kinds—vascular and muscular. RANDALL (*Coll. Phys.*, Philadelphia, 1896) and CRESSWELL BABER (*Brit. Med Journ.*, 1895, vol. ii.) report cases of objective pulsating tinnitus. TOMKA (*Archiv f. Ohrenh.*, vol. xxxix.) and SCHWAGER (*Monatsschr. f. Ohrenh.*, February, 1896) report cases of objective noises in the ear, probably due to spasmodic contractions of the tensor veli muscle.

EPILEPSY FROM EAR DISEASE.

VERDOS (*Ann des Mal. de l'Oreille*, vol. xxii.) maintains that in epilepsy *ab aure læsâ* there is a characteristic aura beginning in the auditory apparatus, as shown by him in 1891. In fact, he asserts that every epileptic in whom the aura begins in the ear should be examined by an aurist. In some cases, however, of manifestly aural epilepsy the aura does not start in the ear, but in one of the extremities. Later it appears in one ear, to which fact the patient may draw the physician's attention, as shown by Verdos. This is a very valuable diagnostic sign.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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A CASE OF LYMPHADENOMA OF THE NASAL FOSSA.

In a Bordeaux Thèsis, DR. DE LA BARRIERE describes such a case (*La Pratique Médicale Journal des Maladies des Oreilles, du Nez et du Larynx*, 1896, No. 18). This neoplasm presents pretty much the same symptoms as do other malignant growths of the nasal fossa, and with a clinical history and a histological constitution identical with those of lymphadenomas of other

regions. It is of neoplastic rather than of infectious origin. The prognosis is always grave, even when radical procedures can be prosecuted at an early stage.

Microscopical inspection alone permits accurate discriminative diagnosis.

Singers' Nodules.

Dr. Emilio Martinez reports (*Archives de la Policlinica*, 1896, No. 4) a case of vocal nodules treated by electro-cauterization. This is one of the few cases which have been observed in the male subject. A report of the case is followed by some general remarks upon the lesion.

Tuberculosis of the Nose.

At a recent meeting of the British Laryngological, Rhinological, and Otological Association (*Journal of Laryngology, Rhinology, and Otology*, 1896, No. 6) Dr. Hill reported a case (presumptively a male, though not so stated in the report) in a tuberculous subject with pain in the nose and an ulcerating granular tumor of the inferior turbinal, with occasional hemorrhages therefrom, thus exciting a suspicion of malignant disease; and this is the feature of the case which seems to have prompted its report. The inferior turbinal was removed for microscopical examination. It resembled a case of intranasal lupus, but the amount of inflammation was too active to accept the opinion that the disease can be of this character. The patient was doing well, but there was great tendency to exuberant granulations. The patient was twenty-eight years of age, married, and not syphilitic.

Dr. Pegler exhibited a section from this turbinal which he pronounced a rarity. The vascular sinuses and a few acinous glands were recognizable, but the latter only with difficulty. Several giant-cell systems appeared in the field, but they were not typical and the giant-cells were small. The zone of leucocytes was very discernible, however, and some of the systems were caseating in the centre, and portions of the epithelial border remained here and there, infiltrated with small cells like the rest of the tissue. There were no bacilli of tuberculosis to be found.

Dr. Hill mentioned that the diagnosis of tuberculosis must be made even though the bacillus has not been demonstrated, for, while the bulk of the growth is inflammatory, giant-cells were present, together with breaking-down nodules evidently tuberculous in nature, as determined by a number of gentlemen to whom the specimen had been presented.

Polypoid Vegetations of the Frontal Sinus.

Dr. Pegler presented at the recent meeting of the British Laryngological, Rhinological, and Otological Association (*Journal of Laryngology, Rhinology, and Otology*, 1896, No. 6) some polypoid vegetations from a case of frontal sinus disease which were very similar to the granulation-polypi removed from the antrum, and are constituted by a very delicate granulation-tissue basis in which are distributed a large number of young and growing cells, and a capillary network ramifies in the tissue, and the growths are fringed with ciliated epithelium.

Canine Epithelioma of the Pharynx.

Dr. Pegler (*Ibid.*) exhibited a specimen in which, with the exception of a slight difference in the shape of the cells, the features presented in the section were similar to those found in the human subject.

Foreign Bodies in the Upper Air- and Food-passages

At the recent meeting of the Laryngological Society of London (*Journal of Laryngology, Rhinology, and Otology*, 1896, No. 6) a discussion well worth reading took place, which was participated in by Dr. Scanes Spicer, Mr. Lawrence, Dr. A. A. Kanthack, Dr. Lambert Lack, Mr. Creswell Baber, and others.

Aneurism of Ascending Pharyngeal Artery.

Most all the cases of this anomaly occur in females. At a late meeting of the New York Academy of Medicine (*Journal of Laryngology, Rhinology, and Otology*, 1896, No. 6) Dr. Sharp presented a case in a female patient, fifty-five years of age.

Dr. Wright mentioned that he had seen two cases; one in an old woman and the other in a young woman.

Dr. Myles stated that he had a case under observation somewhat similar to the one presented, in a man about sixty years of age. The vessel was straight and hard. The patient had general arterio-atheromatous degeneration.

Hay-fever.

Dr. Seth Scott Bishop, of Chicago, contributes (*The Laryngoscope*, July, 1896, No. 1) an article on hay-fever and its successful treatment, the principal point of which is the recognition of the uric acid diathesis as a remote cause, which he combats with the administration of dilute sulphuric acid or of Horsford's acid phosphate. Topically, he recommends a camenthol inhaler—a glass tube packed with camphor and menthol.

Photo-fluoroscopic Pictures of the Larynx.

In the first number of *The Laryngoscope*, a new journal published at St. Louis, Mo., July, 1896, the initial article is one on the photo-fluoroscope, contributed by Dr. J. Mount Bleyer, of New York, the paper having been originally communicated to the Royal Academy of Medicine and Surgery of Naples, Italy, for 1896, in which he describes his apparatus and presents three photo-fluoroscopic pictures of the larynx; one with an intubation-tube in position, illustrating a foreign body in the larynx; one with an illustration of a lost intubation-tube found in the trachea and removed April 2, 1896; and a third one showing an intubation-tube which had shifted out of position into the subglottic region.

OBSTETRICS.

UNDER THE CHARGE OF

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Puerperal Pulmonary Thrombosis.

Lackie (*Edinburgh Medical Journal*, 1896, No. 493) reports the case of a healthy, stout primipara, who had, during pregnancy, anasarca of the lower limbs without albuminuria. Labor was not tedious, was spontaneous, and attended by very little loss of blood. The patient did well and was lifted to a couch on the eleventh day. On the twelfth day the patient walked a short distance in her room, struggled for breath, and died. Efforts were made promptly and vigorously to resuscitate her, but without avail. On post-mortem examination no abnormality was found except pulmonary thrombosis and right heart distended with clot.

Reported cases of this complication show that it occurs most often before the fourteenth day after birth. It usually follows exertion, and is sometimes not fatal when thrombosis is but partial, in many cases accompanied by peripheral thrombosis also. Beyond immediate stimulation with ammonia and ether nothing can be done for serious pulmonary thrombosis. When a puerperal patient becomes easily faint and breathless she must be kept upon her back, all exertion absolutely avoided, and her nourishment carefully administered. Mental exertion and shock are also potent factors in causing this complication.

The Editor adds to the above a brief report of the following case: A young primipara had been greatly depressed during her illegitimate pregnancy; her death had been foretold by a fortune-teller, whom she believed. She had a long, hard labor, the fœtus in breech-presentation, and a marked tendency to uterine relaxation, and hemorrhage was successfully controlled. Sixteen hours after labor she was seized with dyspnœa, syncope, and fatal coma. Auscultation of heart-sounds showed overfilling of the right heart; post-mortem examination was not obtained. Treatment was absolutely unavailing. The patient's symptoms were all those of pulmonary thrombosis and heart-clot.

Closure of Recent Perineal Lacerations.

Appelstedt (*Münchener medicinische Wochenschrift*, 1896, No. 25) calls attention to the importance of complete approximation of the edges of a recent tear to prevent infection from the lochial discharge. It is important that stitches should not pass through the rectal wall, as the contents of the

bowel might contaminate the wound. A comparatively simple method is described and illustrated. Silk or silkworm-gut is used. Stitches are inserted through the skin perineum, being entirely buried as they are passed beneath the highest point of the laceration. These stitches are parallel, and when brought together the lacerated surfaces are joined without passing the needle through the borders of the laceration. The result is good approximation of the torn surfaces, the vaginal and (in complete tear) the rectal tissues being brought together without stitches. Good results are reported by this method.

Rupture of the Uterus.

In the *Münchener medicinische Wochenschrift*, 1896, No. 25, Burger reports a remarkable case of rupture of the uterus in cross-birth. As the patient could not be taken to a hospital and assistance could not be obtained, Burger could do nothing more than make version and extract the fœtus. After delivering the placenta the mother's intestines protruded through the rent in the uterus. These were replaced and the hand kept in the uterus until it contracted firmly. The rent in the uterus was tightly closed by its firm contraction, and but little hemorrhage followed.

The patient did well until the sixth day, when her husband, while drunk, had intercourse with her violently. She recovered, however, from this and was delivered of a living child nine months and six days after. The placenta was adherent to the site of the former rupture and was delivered manually. A year later the patient died of hemorrhage from adherent placenta before the midwife in attendance could summon a physician.

Fœtal Syphilis.

In the *Münchener med. Wochenschrift*, 1896, No. 19, Albers-Schönberg gives the results of his studies in the diagnosis of fœtal syphilis in the Leipzig clinic. He finds, in common with others, that the mere appearance of sanguinolent maceration is not proof that the fœtus perished from syphilis. Considerable increase in the weight of the liver and spleen, with increased weight of the placenta, indicates syphilis. On microscopic examination the bloodvessels of the placenta are much encroached upon by abundant growth of connective-tissue cells. Gradual occlusion of the vessels and anæmia and fatty degeneration result.

Chancres of the Breast.

In *La Presse Médicale*, 1896, No. 39, an interesting clinical lecture by Fournier is reported upon this subject. In order of frequency chancres of the breast come next to those of the lips, excepting chancres on the genital organs. They are found in both sexes, caused in men by suction by the lips of prostitutes. In diagnosis, chancres of the breast must be distinguished from herpes; while this may at first be difficult, the absence of glandular enlargement in herpes will assist. Mammary chancres in women may arise in women who are not nursing from contact of the nipples with the lips of syphilitic men. Among mothers the sore may arise from the infant or

from some manipulation connected with nursing. Most infants who infect a breast are born with syphilis; a few acquire syphilis after birth.

An extraordinary number of chancres of the breast are found in women who have endeavored to pull out the nipples by suction or manipulation to assist the infant in nursing. In some villages women are found who make a practice of bringing milk from the breasts by suction when nursing is difficult. Such a woman, when syphilitic, can infect a large number of women who infect their infants, and often their husbands also.

Diagnosis is often of great importance in these cases. The most usual location of the lesion is upon one breast, without especial frequency regarding which is chosen. It most often develops at the base of the nipple, where it joins the areola; next upon the nipple, and then on the areola. It is rarely found outside these portions of the breast. Chancres of the breast have the same period of incubation as those in other portions of the body. They begin as a very slightly raised, round lesion, red or dark red in color. The centre of the lesion rapidly degenerates, and erosive action forms an excoriated surface. While it is not always possible to recognize the beginning of a chancre promptly, all such lesions should be carefully studied. Three forms of chancre are seen upon the breast: The crater, which has an excavated centre and is found on surfaces made moist by the infant's mouth when nursing; the herpetic form, in which the eruption surrounds the nipple; and, most rare, the phagedenic variety, in which loss of tissue is a marked feature. These chancres persist for several weeks, as a rule, rarely disappearing in nine or ten days. Most of them leave induration and a scar, although this is not invariably the case.

As regards the very important matter of diagnosis, it is a rule to be followed not to diagnosticate a chancre positively during the first four days after its appearance. In cases in which fissure of the nipple makes a positive diagnosis very difficult, it is best, when in doubt, to feed the child for ten or twelve days, keep up the flow of milk by the breast-pump, and study the development of the lesion. If it be chancre, it will enlarge, induration will appear, and the lymphatics will finally enlarge.

So far as prognosis of the sore itself is concerned, it does not differ from that of a chancre on any other part of the body. Syphilitic infection, when communicated through the breast, is often severe, because such women are weakened by labor or are poorly nourished. So far as spreading contagion goes, mammary chancre is most dangerous; cases are recorded where a syphilitic nurse has caused infection of seven persons and one abortion. In another instance a syphilitic infant infected a woman's breast, and fourteen persons became infected and four died. The treatment of the sore is that usually employed for this lesion.

Pregnancy and Labor after Extirpation of one Kidney.

Schramm (*Berliner klinische Wochenschrift*, 1896, No. 6) reports the case of a workingwoman, aged twenty-five years, who had borne two children. She requested the removal of a tumor in her right side which was increasing in size and causing suffering. This proved to be a hydronephrotic kidney, which was removed, the patient making a good recovery. Three years after

she asked her physician's advice regarding marriage, and, as her general health was good and the remaining kidney performed its function well, a possible pregnancy did not seem necessarily dangerous. This subsequently occurred and was endured safely, the urine being abundant and containing no casts or kidney epithelium, but albumin only. The patient was delivered in spontaneous labor of a healthy child, and made a good recovery. But two similar cases are recorded.

Post-mortem Cæsarean Section with the Delivery of a Living Child.

In the *Centralblatt für Gynäkologie*, 1896, No. 14, Erdheim reports the case of a patient, ten months advanced in pregnancy, upon whom it was necessary to make tracheotomy because of a large goitre. Some days after the operation the mother perished through a profuse hemorrhage into the trachea. As soon as life ended in the mother the child was extracted by abdominal incision, and surviving.

The most favorable conditions for success in this method of delivery are found in those cases in which the mother is not suffering from a pathological condition which can be transmitted to the fœtus. If, however, the mother be suffering from profound toxæmia, as in eclamptic cases, or from some infectious disorder, the cause which destroys the mother's life will end that of the fœtus, whether it remains in the womb or is extracted. Cases of sudden cardiac syncope offer very favorable conditions for the performance of post-mortem delivery, because infection is absent from both mother and child.

The Diagnosis of Septic Peritonitis.

In the *Centralblatt für Gynäkologie*, 1896, No. 12, Sippel reports an interesting case which bears upon the results of obstetric surgery. His patient was a woman who had a fibroid upon the posterior wall of the uterus so situated that its removal was possible without removing the womb. This was accordingly done without especial difficulty under antiseptic precautions, the abdomen being closed without drainage. The patient gradually developed a septic condition which was marked by a rapid pulse, by delirium, by icterus, and the presence of bile in the urine. The urine contained no albumin, the bowels moved, the abdomen was not swollen, and the temperature rose but slightly. Death ensued in a condition of delirium. Ten hours before death a considerable quantity of blood was taken from a vein of the arm, and carefully examined for bacteria, with a negative result. Nine hours after death post-mortem examination revealed the intestine lying nearest the pelvis injected and covered with masses of fibrin. In Douglas's cul-de-sac there was a considerable quantity of purulent serum. The posterior surface of the uterus, from which the tumor had been removed, was covered with fibrin and pus. Bacteriological examination showed in the peritoneal exudate pure cultures of the *staphylococcus albus*. Serum taken from a freshly cut surface in the uterine wound gave the same germs. Contrary to expectation, the liver was sterile.

The conditions here present were essentially those which pertain after

Cæsarean section, and hence the symptoms and findings in this case are of interest to obstetricians. The explanation given for the clinical history of the case ascribes an infection at the time of operation as the starting-point. The nervous symptoms resulted from the absorption of toxins, which are especially potent in producing a disordered condition of the liver. The practical point in the case which Sippel makes is to call the attention of his readers to the importance of removing, as soon as possible, such a focus of infection. He regrets that he did not, as soon as symptoms appeared, extirpate the uterus in his case through the vagina. He would thus have removed an infected organ and have drained the pelvis. Applying his observations to obstetric surgery, when symptoms of infection occur after Cæsarean operation, and especially after hysterectomy in puerperal cases, it would seem of the utmost importance that the uterus or the stump of the uterus be at once removed, and that the pelvis be drained through the vagina.

Perforation of the After-coming Head.

In the *Archiv für Gynäkologie*, Band li. Heft 2, Hergenhahn tabulates forty-six cases of perforation of the after-coming head. In twenty-five of these the cranium was opened through the foramen magnum; in two the opening was through the neck; in nine, through the occiput; in three, by means of the smaller fontanelle; in four, through a lateral fontanelle; in one, through the parietal bone; and in two, by means of the base of the skull. In twenty-nine cases delivery was accomplished by traction on the breech; in nine, the sharp hook was inserted in the opening of perforation for purposes of demonstration. In these cases rupture of the uterus occurred once; the cervix was torn eight times; minor lacerations were not infrequent.

The mortality was five in the forty-six cases; one from eclampsia; from previous septic infection, two; from hemorrhage and infection (ruptured hæmatoma of vulva) and from repeated attempts at delivery and mutilation before admission to the hospital, two. Hergenhahn found that craniotomy should be undertaken as soon as the fœtus has perished in suitable cases. The head should be firmly fixed, after version, at the pelvic brim and steadied by an assistant. The cranium should be opened by some form of scissor-perforator through whatever portion is most available. The patient is then put in Walcher's position, the finger of the operator put in the fœtal mouth, and by combined traction the brain is expelled and the head moulded and delivered. The prognosis in cases requiring this operation depends on the condition of the patient before operation, many of them having been lacerated and infected by previous attempts at delivery.

Version with the Patient in the Prone Position.

Mensinga (*Centralblatt für Gynäkologie*, 1896, No. 23) does version, placing the patient upon her abdomen, and has had good results. He thinks this method has the following advantages: The outlet of the pelvis is directed above with the patient prone, giving the operator much more room for the insertion of the hand. The operator's hand and arm are in the position of pronation, giving a better use of the muscles and tactile sense. This posture

widens and opens the uterus and vagina; the contraction-ring disappears in these cases. Risk of bruising the soft parts is less with the patient in this position. The patient has a pillow under the chest, her head turned to one side, while the operator may sit beside her, using either hand for version. By this posture two dangers are minimized: tearing the uterus from the vagina and air-embolism. Patients suffer less pain in this posture. Two illustrative cases are reported in detail.

Nuclein in the Treatment of Puerperal Sepsis.

Hofbauer (*Centralblatt für Gyäkologie*, 1896, No. 17) reports seven cases of puerperal sepsis which were treated by nuclein. The results were a very prompt improvement in the general condition of the patients, a better nervous condition, and the disappearance of the icterus. Puerperal ulcers rapidly healed, foul discharges became inoffensive and purulent, while the temperature at first rose, but then fell very considerably. Patients under this treatment complained of pains in the bones and sensitive feelings about the joints. These disappeared as improvement went on. An increased amount of uric acid was excreted. If used promptly, good results were obtained.

Cæsarean Section versus Total Extirpation.

Coe (*Medical News*, May 30, 1896) reports the case of a primipara who had a tuberculous hip, was dwarfed, and had a highly contracted pelvis, true conjugate two and three-quarters inches. She had œdema and scanty urine. She was extremely weak, and a bad prognosis was given. Total hysterectomy was done after the removal of the child; irrigation with hot saline solution and gauze drainage. The patient recovered, although her kidneys were badly damaged and she had pulmonary œdema. Her child lived a month and died of enteritis.

Coe very clearly shows the folly of allowing a patient so abnormal as to require Cæsarean section to run this risk a second time. In good hands and with patients under observation early in pregnancy, abdominal section will rarely be required; but where positively indicated total extirpation of the uterus offers many advantages.

[In the discussion of this paper before the American Gynecological Society various opinions were expressed. An earnest plea was made to apply to obstetric surgery the rules governing the operator in other branches of surgery. While patient's rights as to the preservation of organs and functions must be respected, the obstetrician should be governed by reason, and not by superstition and sentiment, which have done so much to retard the progress of obstetric science.]

Osteomalacia.

In the *Edinburgh Medical Journal*, 1896, No. 491, Ritchie reports the case of a multipara who, after an abortion, had pains in the bones, inability to walk, with the characteristic changes in the pelvis. The removal of the ovaries was followed by speedy recovery.

GYNECOLOGY.

UNDER THE CHARGE OF
HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

Internal Administration of Ovarian Tissue.

Chrobak (*Centralblatt für Gynäkologie*, 1896, No. 20) presents the results of his experiments extending over seven years, the object of which has been to prevent or to mitigate the various disturbances following the removal of the ovaries, especially in young women. In his first case fresh or ovarian tissue from calves was administered internally. The ovary was chopped finely and given raw in doses of from twenty to thirty grains. The result was negative. Thinking that the ovaries of mature animals would be more efficacious, he had ovaries from healthy cows washed with ether and alcohol, dried, powdered, and made into pastilles, each of which contained three grains of ovarian tissue.

Seven patients were treated daily with from two to five tablets, receiving on an average twelve grains. In six cases both ovaries had been removed; the other patient, with normal genitals, was suffering from unusually severe climacteric disturbances. In one instance after two weeks' treatment the hot flushes, dizziness, etc., recurred only three instead of ten times daily, and were entirely absent at night. As soon as the treatment was suspended the disturbances reappeared. Two patients who received each twelve tablets reported that the climacteric phenomena ceased entirely, and a third that after taking twenty tablets the attacks were only one-half as frequent as before. The patient who was at the physiological menopause was similarly affected. No bad effects followed at any time. In every case the writer was careful to eliminate the factor of auto-suggestion.

While he does not claim for the remedy any positive results as yet, he thinks that it promises well. However, he believes that the best plan is to leave the whole or a part of an ovary whenever it is possible, even when it is necessary to extirpate the fibroid uterus.

Landau (*Berliner klin. Wochenschrift*, 1896, No. 25) has been employing this treatment at his clinic for several months, as suggested originally by Mainzer and subsequently by Mond and Chrobak. Cases were carefully selected, in order to control the experiments, with especial reference to the effect of the remedy upon the characteristic "hot flushes" so common at the menopause, both natural and artificial. The isolation of the active principle of ovarian tissue has not yet been effected. The writer believes that it is probably a nucleo-albumin, or perhaps an albuminous body like spermin. He used the ovaries of cows and pigs, dried at a temperature of 60° to 70° C. for twelve hours, then pulverized and made into tablets, each of which contained seven and one-half grains.

Although not prepared to present any positive results, the writer believes that the remedy does possess the power of modifying the unpleasant phenomena of the climacteric, whether physiological or anticipated, without producing any evil effects, and deserves careful consideration.

Transplantation of the Ovary.

Knaner (*Ibid.*), in a preliminary report on this subject, describes his experiments on rabbits. The animals were anæsthetized, and the strictest aseptic precautions were observed. In the first experiment each ovary was ligated with silk and excised with as little handling as possible. One ovary was then sutured to the horn of the uterus with silk, which did not include the ovarian tissue; the other was placed between the fascia and muscle, to the right of the abdominal wound, the latter being then closed with tier-sutures. In the second experiment two rabbits were operated upon in a similar manner, the ovaries being all attached to the uterine cornua.

One rabbit died six months after the operation. The ovary attached to the uterine cornua was perfectly nourished, and on section contained normal stroma and ripe ovisacs with ova, as well as young follicles in the process of development. Microscopical examination of the ovary which had been placed between the layers of the abdominal wall showed that at least one-third of the gland was well nourished by newly formed vessels and contained numerous ovisacs. In two other rabbits the condition formed several months after operation was practically the same; *i. e.*, the ovaries were atrophied, but still contained a considerable amount of normal tissue and were undoubtedly functionally active.

The following deductions are made from these experiments: 1. In rabbits the ovaries may be transplanted to localities distant from their normal site. 2. They may be attached to the peritoneum or placed between muscular tissue. 3. Ovaries thus transplanted are not only nourished, but continue to develop Graafian follicles, which ripen and probably discharge their ova. The writer states that he intends to extend his observations to other animals, and also to transplant ovaries from one individual to another, noting especially whether fecundation follows the operation.

Hernia of the Ovary in an Infant.

Lockwood (*British Med. Journal*, June 13, 1896) reports the following interesting case: A female infant, aged six months, suddenly became ill, drawing up its legs as if suffering from severe abdominal pain. Two days later a swelling was noticed in the right inguinal region, tender, and disappearing on pressure. When brought to the hospital an examination of the little patient showed a tense, oval swelling, three inches long and an inch and a half broad, the skin covering it being inflamed. There was no impulse on crying. Obstinate constipation and occasional vomiting were present, but flatus and later fecal matter were passed. The diagnosis of strangulated inguinal hernia was made. On incising the swelling a quantity of dark grumous fluid escaped, and a mass appeared which was at first supposed to be the cæcum, but proved to be the fimbriated end of the Fallopian tube and a

hemorrhagic ovary, the pedicle which emerged from the internal abdominal ring being twisted half around its axis, but not constricted at the ring. The pedicle was transfixed and tied, the tube, ovary, and sac excised, and the stump attached beneath the internal oblique and transversalis muscles. The inguinal canal was sutured and the external wound closed with silkworm-gut. The patient's convalescence was normal. The cause of the torsion was obscure, but was probably due to the fact that as the ovary and tube slipped through the internal ring, the ovary lay in front of and above the tube and slipped down in front of it, thus producing the twist. A similar case has been reported by Owen.

Severe Hemorrhage following Coitus.

Chaleix (*Gaz. Heb. de Méd. et de Chirurgie*, 1896, No. 45) reports the following cases:

Case I.—A young woman, aged twenty-two years, gave the history of a "bleeder." The first coitus was not difficult, but was followed by such profuse bleeding that it could not be controlled by compresses. On examination the patient was found to be pale and cold, with a feeble pulse. The hymen was torn in two places, and behind it on the posterior vaginal wall there was an erosion the size of a franc; free oozing from the raw surface persisted, but was controlled by a gauze tampon. Intercourse subsequently took place without a recurrence of the bleeding, but following her accouchement the patient had a severe hemorrhage.

Case II.—A strong, healthy woman, twenty-four years of age, suffered severe pain at the first matrimonial approach, so that the act could not be completed. There was no hemorrhage. The attempt was unsuccessful until the fourth night, when intromission occurred, attended with great suffering and free hemorrhage, which continued all night. It was checked with a hot vaginal douche, but recurred and continued for several hours until the patient was completely exhausted. On examination it was found that the blood came from tears in the posterior wall of the vagina, which was more contracted than normal. The bleeding was controlled by a tampon. Coitus was afterward performed without difficulty; the patient became pregnant, and had a normal confinement.

Case III.—A vigorous woman, aged thirty years, married to a husband considerably younger than herself, suffered so much pain at the first coitus that she fainted. There was such profuse hemorrhage that the bed was soaked. On examination a spurting vessel was seen at the posterior edge of the hymen, and there were several bleeding surfaces in the posterior vaginal wall. The entire hymenal ring was torn away at its base. The vessel was ligated and the vagina tamponed with gauze, when the bleeding was arrested.

Necrosis in Uterine Fibromyomata.

Hartmann and Mignot (*Annales de Gynécologie et d'Obstétrique*, 1896, No. 6) report a fatal case of general suppuration and necrosis of a uterine fibroid which they attributed to infection by anaërobic microbes. The latter

appeared in the form of short bacilli, frequently joined together, which were found in large numbers on the surface of the uterine mucosa as well as in the pus within the tumor. Identical forms have been found in the pus from a suppurating cyst of the vagina, in abscesses of Bartholin's glands, and also in abscesses of tubal origin. The writers infer that in the case reported infection took place through the lymphatics extending from the endometrium to the capsule of the tumor. It was carefully studied, because it seemed to throw some light upon the question of the etiology of necrosis in these growths.

Calcium Carbide in Inoperable Carcinoma.

Guinard (*Sem. Méd.*, 1896, No. 18) reports several cases in which he used local applications of this remedy, which has both a caustic and a hæmostatic action. A fragment about the size of a marble is applied to the diseased surface and is kept in position for four days by a tampon of iodoform-gauze, when the latter is removed and a douche given. Some pain is caused during the first few hours. Pain is relieved, hemorrhage and foul discharges are checked, and the affected surface becomes dry and smooth.

Dermoid Cyst in an Infant.

Sant Anna (*Ibid.*) reports a successful case of ovariotomy in an infant, one year old, in whom the tumor had reached an appreciable size seven months before. It proved to be a dermoid cyst weighing two pounds. The recovery was uneventful.

Nine other cases are reported in which the ages of the patients varied from twenty months to seven years, four terminating fatally.

Discussing the question of operative interference in cases of abdominal enlargements in young children, the writer urges the propriety of an explorative incision rather than puncture, since the prognosis is absolutely bad unless something is done; and, if the abdomen is opened, it may be found that the growth is of ovarian origin and can be safely removed, while the mere exploration may be curative in tuberculous ascites.

Suppuration in Ovarian Cysts.

Bouilly (*La Gynécologie*, June, 1896), in a clinical paper on this subject, devotes considerable space to the question of etiology. Owing to the infrequency of tapping at the present day, it is rare that a cyst becomes infected from without. Infection usually comes from an adjacent septic focus, either through the lymphatic channels or bloodvessels, or by direct continuity through the medium of new-formed adhesions. In cases of suppuration of the cyst-contents following labor septic germs are doubtless conveyed through the lymphatics of the broad ligaments from the infected endometrium.

The writer has never observed a case of suppuration which could be attributed to coitus during menstruation, as suggested by Mangold. Infectious general diseases may serve as etiological factors. Two cases of suppuration following typhoid have been reported by Werth, in one of which the

characteristic bacilli were found in the cyst-contents. Here the infection is doubtless through the medium of the circulation.

In many cases the cause of the suppuration is unknown, especially in dermoids, so that Mangold has advanced the hypothesis that it may result purely from chemical changes in their contents. Infection of ovarian cysts may be distinguished as saprophytic, due to the presence of saprophytic staphylococci, bacterium coli, etc., and septic, caused by pyogenic micro-organisms, such as the streptococcus pyogenes, gonococcus, bacterium coli commune, and typhoid and tubercle bacilli. The clinical symptoms and prognosis are much graver in the latter case, being those of general as contrasted with those of local infection.

Uterine Cardiopathies.

Kisch (*Gaz. de Gynécologie*, June, 1896) calls attention to the reflex cardiac disturbances observed in women at certain crises in their lives—at puberty, at the menopause, just after marriage, and also during pregnancy and labor. These are palpitation, abnormal acceleration and slowness of the pulse, præcordial pains, dyspnœa, sense of oppression, etc.

In young subjects with these symptoms the external genitals may be non-developed; menstruation is established with difficulty, and is scanty and irregular. When these women reach the climacteric they have a return of the same phenomena which appeared at puberty, especially if they have been weakened by several previous labors and profuse hemorrhages. Simultaneously with the cardiac disturbances they are troubled with marked gastric irritability.

These cardiac neuroses are undoubtedly due to the physiological changes in the ovaries at puberty and the menopause, though they may be attributed to certain chemical changes which occur during the development and atrophy of the Graafian follicles. The condition is doubtless one of hyperæsthesia of the cardiac plexuses.

To some extent these cardiopathies seem to be hereditary, and are observed most frequently among the better classes.

The treatment recommended is hygienic and moral, rather than medicinal.

True and False Capsules in Ovariotomy.

In a short but most instructive paper on this subject Doran (*British Medical Journal*, April 18, 1896) points out the anatomical difference between real and apparent encapsulation of ovarian cysts, and shows how important it is for the operator to recognize the true condition before beginning the enucleation of the sac.

In the case of an intraligamentous cyst the capsule consists entirely of the mesosalpinx, and presents a dull-red capsule which moves freely over the cyst-wall. After tapping, the sac can be drawn out readily and a pedicle can be obtained without enucleation. This is to be distinguished from false encapsulation, in which the cyst is firmly adherent to the floor of the pelvis and to the posterior layer of the broad ligament, and is covered with a pseudo-capsule, with the tube apparently lost on its surface, as in the former case; but here the uterus is flattened against the anterior aspect of the tumor,

instead of being pushed over to the opposite side. The anatomical relations are apparently identical with those in the former case, and the surgeon often finds out his error only after removing the cyst and finding that no capsule remains, while the tube and mesovarium are intact.

The important practical point is that if the intraligamentous development of the growth is recognized at the onset, the surgeon can begin the process of enucleation cautiously, working between the folds of the broad ligament, and thus avoiding important structures, instead of lacerating the peritoneum and injuring ureters or larger veins by trying to tear up a cyst which he erroneously supposes is bound down in Douglas's pouch. Moreover, the after-treatment of the true capsule (by suturing or drainage) will be entirely different from that of a case of false encapsulation.

Retroflexion due to Amputation of the Cervix.

Gottschalk (*Deutsche med. Wochenschrift*, 1896, No. 18) reports several cases to support his assertion that amputation of the portio vaginalis is resorted to too frequently, since the operation not only often fails to meet the indications, but is even productive of harm by establishing a true pathological condition. In the five cases reported retroflexion afterward developed, the uterus being previously in a normal position. He attributes this condition to the fact that with the removal of the portio the relations between the cervix and corpus uteri are changed, and at the same time cicatrices are formed anterior to the stump, which tend to draw it forward and thus to throw the fundus backward. Unfortunately, these cases cannot be treated by pessaries, and the cicatricial contraction often gives rise to so much disturbance that subsequent ventrofixation becomes necessary.

The writer states that in the rare instances in which he now amputates the cervix he performs partial amputation only, so that the portio shall retain its normal length.

Thyroid Extract in the Treatment of Uterine Fibroids.

Jouin (abstract in *La Gynécologie*, June, 1896), having had occasion to administer thyroid extract to a stout woman for the purpose of reducing her weight, noticed that not only was the obesity diminished, but a large uterine fibroid which extended above the umbilicus rapidly lessened in size until it attained only one-fourth of its former dimensions.

He accordingly selected seventeen cases of fibroids, which were treated by the internal administration of thyroid, with the following results: In twelve cases in which hemorrhage was a marked symptom there was a noticeable diminution in the size of the tumor, while the hemorrhage practically ceased; of five large tumors, in feeble subjects, two were decidedly affected, two but slightly, and one not at all.

Five other patients with profuse menorrhagia attributed to the climacteric, two with bleeding due to carcinoma, and one with an intrauterine polypus were treated with the same remedy.

The writer concludes that thyroid extract does cause a marked reduction in the size of uterine fibroids, while the symptoms—pain, pressure, general weakness, and especially hemorrhage—are certainly relieved. Moreover, it causes a diminution of the menorrhagia in women at the climacteric.

PÆDIATRICS.

UNDER THE CHARGE OF

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OF PHILADELPHIA;

ASSISTED BY

THOMPSON S. WESTCOTT, M.D.,

OF PHILADELPHIA.

PALSY OF OCULAR MUSCLES IN HEREDITARY SYPHILIS.

ZAPPERT (*Archiv f. Kinderheilk.*, Bd. xix. S. 161) relates a rare example of ocular palsy as the sole manifestation of hereditary syphilis. A girl of five years was brought for consultation because of a strabismus which had suddenly appeared after an attack of headache, vomiting, and prostration.

Examination showed complete ptosis of the left upper lid. The left globe deviated to the temporal side, causing a divergent squint, its voluntary excursus being limited to outward and slight downward movements. The pupil was moderately dilated, larger than its fellow, presenting a paralysis of accommodation and not reacting to light. The right eye was normal. There were no stigmata of syphilis and no visceral lesions. The mother, however, had been under treatment for syphilis years before. In view of this fact the child was submitted to specific treatment, and was cured completely in three months.

According to the author, the ocular palsy might be caused by a gumma of the brain, a basal meningitis, or a neuritis of the oculomotor; and he finally decides upon the last.

SUPPURATIVE ARTHRITIS DUE TO THE GONOCOCCUS IN A NEWBORN INFANT.

GRIFFON (*Presse Médicale*, 1896, No. 15) reports the case of a newborn infant suffering from a double purulent ophthalmia with perforation of the cornea, in whom purulent arthritis of the right hip and wrist-joint was afterward observed. Under treatment the articular lesions improved, but the child succumbed to an infectious diarrhœa. Bacteriological examination during life gave the following results: 1. In the liquid obtained by puncture from the hip-joint numerous leucocytes and a few microbes, staphylococci and probably gonococci, were observed. Cultures gave the staphylococcus albus. 2. The conjunctival pus contained gonococci, staphylococci, and a special bacillus, the latter two only yielding cultures. 3. The vaginal secretions contained gonococci and staphylococci. 4. Several examinations of the blood gave negative results. After death pus from the hip- and wrist-joints showed diplococci having all the characteristics of gonococci. Cultures showed staphylococci and the special bacillus found in the ocular and vaginal pus. Blood taken from the heart was sterile.

A Case of Erysipelas Neonatorum Cured by Antistreptococcic Serum.

Ernest A. T. Steele (*British Medical Journal*, December 7, 1895) records a case of extensive erysipelas in a child aged three weeks cured by antistreptococcic serum. The disease began at the umbilicus, which was not yet healed, spreading downward over the hypogastric and iliac regions, buttocks, and upper part of the thigh, involving also the penis and scrotum. After the first injection of 6 c.cm. of Ruffer and Robertson's antistreptococcic serum the child began to take the breast, looked better, and the redness ceased to extend and lost its defined margin. Another injection was given at the end of twenty-four hours, and a third, of 5 c.cm., two days later. Five days later the child was well, excepting for a slough of the scrotum. The ulcer soon healed. The author has never seen a case recover when the disease was so far advanced as in this one. No other treatment of any kind was adopted.

Diagnosis and Treatment of Diphtheria.

Hilbert (*Deutsch. Archiv f. klin. Med*, March 26, 1896) discusses exhaustively the bacteriological diagnosis of diphtheria and the results of the serum-treatment. He deprecates any tendency on the part of physicians in private practice to leave the use of antitoxin to hospitals. As a usual thing, a diphtheria-patient has been sick several days before being sent to a hospital, and, as pointed out by Behring [a point which needs to be repeated with emphasis until it is universally understood], the chances for a favorable effect of the antitoxin are so much the better the earlier it is injected. The theoretical foundation of this postulate is plainly seen, if, as is accepted by the highest authorities, the Loeffler bacillus be the cause of diphtheria and produce its effects through a toxin. An early injection of antitoxin will neutralize some of the toxin already absorbed, preventing any further deleterious effect from that amount of toxin and enabling the system to overcome the infection so much earlier than would otherwise be the case. To allow of an early injection an early diagnosis is desirable. In typical cases this, of course, is easy: it is difficult in mild cases and in some cases of lacunar angina, which differ clinically from diphtheria only in their benign nature as regards termination and sequelæ and in their occurrence more commonly in adults. While the direct examination of a cover-glass preparation often gives good results, much greater accuracy is obtained through a culture, the preferable medium being Loeffler's sugar-bouillon blood-serum, although glycerin-agar may be used. The pseudo-diphtheria bacillus may give rise to uncertainty in some instances; but this, as described by Loeffler, in comparison with the true, is shorter and broader, grows more luxuriantly on agar, does not render bouillon acid, and has no virulence. It has been found to be of sufficient clinical accuracy to base a judgment on the morphological and cultural appearances, having recourse only rarely to a test of the virulence toward guinea-pigs.

With regard to cases of mixed infection Loeffler pointed out in his earlier publications that the diphtheria-bacilli were associated with many other micro-organisms, especially streptococci. Roux and Funk have shown that

the diphtheria-bacilli seem to be more virulent in the presence of streptococci, or at least that animals so infected do not always recover under the use of antitoxin, "because," as Roux says, "the cells struck by the streptococcus-toxin no longer respond to the stimulation of [the diphtheria] antitoxin." As it is rare to obtain a pure culture of the bacilli from a case of diphtheria, it is well to know when to consider a case one of mixed infection. Bacteriologically, this occurs when the cocci have invaded the internal organs or have set up cervical abscess or broncho-pneumonia. Clinically, "septic diphtheria" does not always coincide with the above, as Genersich has shown. It speaks well for the serum-treatment that the secondary streptococcus infection occurs so much less often the earlier the antitoxin is injected.

In reviewing the reported results of this treatment, a table compiled from reports of 100 or more cases treated in hospitals, and including 6000 cases in all, showed a lowering of mortality, as compared with preceding years, of about 20 per cent. The opponents of the treatment claim that two factors produced this lowering—a mild epidemic and an increase in the number of cases sent to hospitals. The first objection loses all weight in the light of Baginsky's experience when the supply of serum was exhausted, and in the universal coincidence between a low mortality and the use of the antitoxin. That more cases were admitted to the hospitals is also untrue, according to the table compiled by Behring for Berlin, showing that the percentage of hospital-cases to the total number of cases has grown less since 1892.

Collected reports of 400 cases occurring in private practice show a mortality of 7.9 per cent. Another table compiled by Behring shows that the decrease in the mortality in Berlin (where the antitoxin has been extensively used) has been not only relative to the total number of cases, but also absolute; so that while the cases for 1894 exceeded those of 1893 by 1000, the deaths in 1894 were nearly 100 less; and the indications for 1895, gauged on the first six months, were that the reductions would amount to several hundreds, the total number of cases still showing an increase over those in 1894.

The author reports 40 cases of diphtheria treated with antitoxin, mortality 2.5 per cent. (the only fatal case being moribund at the time of injection and dying in fourteen hours); and 23 cases without antitoxin, mortality 13 per cent. The cases are thoroughly studied from every point of view and reported in detail.

Treatment of Pneumonia in American Children's Hospitals.

In the *Archives of Pediatrics*, April, 1896, are to be found reports from six children's hospitals in the leading cities of the United States, outlining their methods of treating pneumonia in children.

At St. Mary's Free Hospital for Children, New York, according to Swift, broncho-pneumonia is treated in a room warmed to 75° or over; a kettle of water is kept boiling, upon which a vessel containing creosote or pine-needle oil is kept constantly steaming. For restlessness, pain, or excessive cough, one to three grains of Tully's powder is given and repeated according to effect. Sometimes, where secretion is very copious and watery, nitroglycerin is used with much freedom. Alcohol is freely used in these cases, and

sometimes strychnine. If an expectorant is needed, ammonium chloride is preferred; and when cough persists some preparation of creosote is used. Externally the chest is rubbed with camphorated oil or turpentine and oil. Lobar pneumonia is treated on a different principle. Besides the usual hygienic treatment the author gives all cases calcium chloride in doses of 2 to 5 grains every two or three hours. For relief of pain and excessive cough Tully's powder is given; and for quiet and sleep, occasionally phenacetin or sulfonal. High temperature is controlled by sponging, the cool bath or graduated bath, and occasionally, in cases that bear it well, by phenacetin.

In the Babies' Hospital, New York, where only cases under three years of age are received, says HOLT, about one-fourth are lobar cases and three-fourths broncho-pneumonias. The children are kept in an airy ward by themselves at a temperature of 70° F. Great care in dieting is taken at once; and if fermentation in the colon is noted, the bowel is emptied daily by irrigation. Expectorants are almost entirely discarded. For restlessness phenacetin or codein. High temperature, when attended by extreme nervous symptoms, is controlled by cold in one or other of the various forms of using this agent. Counter-irritation is made by means of a paste of one part of mustard to six of flour, left on the chest for five or six minutes at a time, repeated three to eight times daily. Steam-inhalations are used systematically in a tent, creosote, turpentine, or benzoin being vaporized at the same time. Whiskey is the main reliance as a stimulant, with strychnine and at times nitroglycerin. The oil-silk jacket is worn throughout the attack.

At the Children's Hospital, Philadelphia, GRIFFITH reports, the cotton-jacket is used by some of the staff, but has been discarded in his own practice. Hot-jacket poultices are occasionally used when there is pain or dyspnœa; counter-irritation by turpentine or amber oil. The coal-tar antipyretics are rarely used, and digitalis and strychnine are reserved until the circulation demands them. Digitalis, especially, is often pushed beyond the usual limits. Alcohol is not used as a routine treatment, but when indicated is given in proportionately large doses.

At the Children's Hospital, Boston, says BUCKINGHAM, in a paper treating only of the lobar variety, poultices are never and the jacket rarely used. Brandy is used more than all other stimulants, though digitalis and strychnine are employed where there is a weak heart.

At the New York Foundling Hospital, NORTHRUP writes, the patients are under two years. For localized pain he uses intermittent poulticing with one part of English mustard to three or four parts of flaxseed; internally opium is given. High temperature is treated by sponging or more decided hydrotherapy. As stimulants, strychnine, whiskey, digitalis, and nitroglycerin—the latter when there is a tendency to duskiness of the ears, lips, or nose.

At the Children's Hospital, Washington, according to ADAMS, the cotton-jacket is worn throughout an attack of croupous pneumonia. Dry cups followed by hot poultices are used to relieve pain and surface-congestion. Temperature is controlled by sponging or the graduated cold bath. Antipyretics are avoided, but quinine by the mouth is sometimes used. Ammonium carbonate and whiskey are judiciously pushed when indicated, and later camphor, nitroglycerin, strychnine, and sometimes ether are used, the

latter three sometimes by hypodermic. Ammonium chloride is sometimes given after crisis. In broncho-pneumonia the treatment is much the same, and in mild cases little is required. In more extensive inflammations counter-irritation by mustard pastes, turpentine stupes, or camphorated oil is employed, and poultices in intense or general pulmonary congestion. Ammonium carbonate is given as a stimulant and expectorant, and nitroglycerin as a cardiac stimulant is strongly advocated, but other stimulants are cautiously ordered.

Lesions of the Kidney in Athrepsia.

Simmonds (*Deutsches Archiv f. klin. Medicin*, 1896, Bd. lvi. p. 385) reports the results of examinations of the kidneys of 60 athrepsic infants who had succumbed without presenting respiratory or digestive disturbances. In all cases the kidneys showed the existence of a parenchymatous nephritis with lesions of the epithelium of the urinary tubules. In explication of the etiology of this nephritis the author states that the gravity of the renal lesions had no relation to the gravity and duration of the athrepsia; and he thinks that the disturbance of nutrition was altogether secondary. The terminal broncho-pneumonia, or the profuse diarrhœa, either of which was present in only a few cases, was likewise excluded. He finally attributes the nephritis of athrepsia to a constant complication of the condition, namely, otitis media. Of 133 cases of athrepsia examined after death, 128 were found to have purulent otitis media; and of the 60 cases forming the basis of his study, such an otitis was present in all. Cultures of this exudate showed the presence of many bacteria, among which were the pneumococcus of Fränkel, the pneumobacillus of Friedländer, the streptococcus, staphylococcus, bacillus pyocyaneus, and others. These micro-organisms were found also in the kidneys. The author, therefore, concludes that the nephritis found in nearly all cases of athrepsia is, in the majority of instances, dependent upon a coincident otitis media.

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